



SEQUENCE LISTING

<110> Wesley, Susan W.
Waterhouse, Peter
Hollowell, Christopher A.

<120> Method and means for producing efficient cloning constructs
using recombinational cloning

<130> HELLGA

<160> 26

<170> PatentIn version 3.1

<210> 1
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attB1

<400> 1
ggcggcttt ttgtacaaa cttgt 25

<210> 2
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attB2

<400> 2
ggcggcttt cttgtacaaa cttgt 25

<210> 3
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attB3

<400> 3
ggcggcttt cttgtacaaa cttgt 25

<210> 4
<211> 25
<212> DNA
<213> Artificial sequence

<220>

<223> core sequence of recombination site attR1

<210> 4
gttcagcttt ttgtacaaa gttg

18

<211> 8
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attR2

<400> 5
tttcagcttt ttgtacaaa gttg

25

<210> 6
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attR3

<400> 6
tttcagcttt ttgtacaaa gttg

25

<210> 7
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attL1

<400> 7
agcctgcttt ttgtacaaa gttg

25

<210> 8
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attL2

<400> 8
agcctgcttt ttgtacaaa gttg

25

<210> 9
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> core sequence of recombination site attL3

<410> 7
 Arabidopsis thaliana J133

18

<111> 11
 <112> 18
 <113> DNA
 <213> Artificial sequence

<221>
 <213> core sequence of recombination site attP1

<410> 10
 gttcagcttt cttgtacaaa gttgg

25

<210> 11
 <211> 25
 <212> DNA
 <213> Artificial sequence

<220>
 <223> core sequence of recombination site attP2,P3

<400> 11
 gttcagcttt cttgtacaaa gttgg

25

<210> 12
 <211> 1188
 <212> DNA
 <213> Artificial sequence

<220>
 <223> cDNA sequence of the Arabidopsis thaliana chalcone synthase coding region

<400> 12
 atgggtgatgg ctgggtgcttc ttctttggat gagatcagac aggctcagag agctgatgga 60
 cctgcaggca tcttggtat tggcactgct aacctgaga accatgtgct tcaggcggag 120
 tctctgact actacttccg catcaccac acgtgaacaca tgaccgacct caaggagaag 180
 ttcaagcgca tgtgcgacaa gtgcacaatt cggaaaacgtc acatgcattt gacggaggaa 240
 ttctcaagg aaaaaccaca catgtgtgct tacatggctc cttctctgga caccagabag 300
 gacatcgtgg tggtcgaagt ccctaagcta ggcacaagaag cggcagtga ggccatcaag 360
 gagtggggcc agcccaagtc aaagatcact catgttgtct totgcactac ctccggcgtc 420
 gacatgcctg gtgctgacta ccagctcacc aaagcttctt gtctccgtcc ttccgtcaag 480
 cgtctcatga tgtaccagca aggttgcttc gccggcggta ctgtctcccg tatcgttaag 540
 gatctcgccg agaacaaccg tggagcacgt gtctctgttg totgtctga gatcacagcc 600
 gttaccttcc gtgggtccctc tgacacccac cttgactccc tctgtgggta ggctcttttc 660
 agtgaatggc ccgcgcgaact cattgtgggg tggaccctg acacatttgt cggagagaaa 720
 cccatctttg agatgggtgt tgcgcgtcag accatcttc cagactctga tgggtgccata 780
 gaaggacatt tgagggaagt tgggtctcac ttccatctcc tcaaggatgt tcccggcctc 840
 atctccaaga acatttgtga gagtctagac gaagcgttta aacctttggg gataagtgac 900
 tggaaactcc tctctgtgat agccacccct ggaggtccag cgatctaga ccaggtggag 960
 ataaaagctag gactaaagga agagaagatg agggcgacac gtcacgtgtt gagcgagtat 1020
 ggaaacatgt cgagcgctg cgttctcttc atactagac agatgaggag gaagtcagct 1080
 aaggatgggt tggcacaac aggagaaggg ttggagtggt gtgtcttgtt tgggtctgga 1140
 ccaggtctca ctgttgagac agtcgtcttg cacagcgttc ctctctaa 1188

<210> 13

```

<211> 16691
<212> DNA
<213> Artificial sequence

<214>
<215> acceptor vector pHELLSGATE

<216>
<217> misc_feature
<218> (7922)..(9448)
<219> spectinomycin resistance

<220>
<221> misc_feature
<222> (10736)..(11324)
<223> right T-DNA border fragment

<224>
<225> misc_feature
<226> (11674)..(13019)
<227> CaMV35S promoter fragment

<228>
<229> misc_feature
<230> (17890)..(17659)
<231> attP1 recombination site (complement)

<232>
<233> misc_feature
<234> (17610)..(16355)
<235> ccdB selection marker (complement)

<236>
<237> misc_feature
<238> (16551)..(16319)
<239> attP2 recombination site (complement)

<240>
<241> misc_feature
<242> (14660)..(16258)
<243> pdk2 intron 2

<244>
<245> misc_feature
<246> (15102)..(15661)
<247> chloramphenicol resistance gene

<248>
<249> misc_feature
<250> (14387)..(14619)
<251> attP2 recombination site

<252>
<253> misc_feature
<254> (13675)..(13980)
<255> ccdB selection marker (complement)

<256>
<257> misc_feature
<258> (13148)..(13279)
<223> attP1 recombination site

```

<220>
 <221> misc_feature
 <222> (17932)..(18687)
 <223> nopaline synthase gene terminator region

<220>
 <221> misc_feature
 <222> (1864)..(4967)
 <223> nopaline synthase gene promoter

<220>
 <221> misc_feature
 <222> (4977)..(1442)
 <223> nptII coding region

<220>
 <221> misc_feature
 <222> (1443)..(2148)
 <223> nopaline synthase gene terminator

<220>
 <221> misc_feature
 <222> (2149)..(2706)
 <223> a left T-PNA border region

<401> 13
 ggccgaacta gtgatatccc ggggccatgg cggccggggag catgcgaagt cggggcccaat 60
 tggccctata gtgagtcgtt ttacaattca ctggccgtcg ttttacaacg tcttgactgg 120
 gaaaccctg cggttaccca acttaatcgc cttgcagcac atcccccttt cggccagctgg 180
 cgttaatagc aagagggccg caccgatcgc ccttcccaac agttgcgcag cctgaatggc 240
 gaattgaaat tgnaaacgtt aatgggtttc tggagtttaa tgagctaacg acatacgtca 300
 gaaaccatta ttgcggtttc aaaagtgcgc taaggtcaact atcaggtagg aaatatctct 360
 tgtcaaaaaa gttccactga cgttccataa attccccctg gtatccaatt agagttctcat 420
 attcaactctc aatccaaaata atctgcaatg gcaathacct tatccgcaac ttctttacct 480
 atttcggccc ggatcggggc aggtctctcc ggcgcttggg tggagaggct attcggctat 540
 gactgggcac aacagacaaat cggctctctc gatgcgcgcg tgttcgggct gtcaggcag 600
 gggcgccggg ttctttttgt caagacgcac ctgtccgggt cctgaatga actgcaggac 660
 gaggcagcgc ggctatcgtg gctggccacg acggcggttc cttgcgcagc tgtgtctgac 720
 gttctcactg aagcgggaag ggaactggtg ctattggggc aagtgcgcgg gcaggatctc 780
 ctgcatcttc accttgcctc tgcgagaaa gtatccatca tggctgatgc aatgcggcgg 840
 ctgatacgc ttgatccggc tacctgcca ttgcaccacc aagcgaacaa tgcctatgag 900
 cgaacacgta ctccgatgga agccggtctt gtgatccagg atgatctgga cgaagagcat 960
 caggggctcg cgcagccga actgttcgcc aggtccagg cgcgcgatgc cgacggcag 1020
 gatctcgtcg tgacccatgg ccatgcctgc ttgcgaata tcatggtgga aaatggcgc 1080
 tttcttggtt ccatcgactg tggccgggtg ggtgtggcg accgctatca ggacatagcg 1140
 ttgtctaccc gtgatattgc tgaagaggtt ggcggcgaat gggctgacgc cttctctgtg 1200
 ctttaacggt tgcgcgctcc ccatccgag cgcctcgcct tctatcgcct tcttgaacag 1260
 ttctcttgag cgggactctg gggttcgaaa tgacgcacca agcgaacgccc aacctgccat 1320
 caccagattt ccatccacc gccgcctctt atgaaagggt gggcttcgga atcgttttcc 1380
 gggcgccggc ctggatgata ctccagcgcg gggatctcat gctggagttc ttgcgcacc 1440
 ccgatccaac acttaacgtt gcaacgtcca agagcaata gaccacgaac gccggaaggt 1500
 tgcgtgagcg tctggattgc gtctcaattc tctcttgacg gaatgcaatg atgaatatga 1560
 tactgaactat gaaactttga ggaataactg cctagcacgc taacctcata acgtgcata 1620
 tgcctgcctt gacaacatgg aacatcgcta tttttctgaa gaattatgct cgttggagga 1680
 tgttgcggca attgcagota ttgcacaacat cgaactaccc ctcaacgcag catctcatca 1740
 tattattoat cgggggaaag gcaagattaa tccaaactgg aaatcatcca gctgtattgg 1800
 taatttcagt tccagcgaat tgattcgttt tgggtgatac cactttttca ataaggacga 1860
 gatgggtggg taaagaaggga gtgcgtcgaa gcagatcgtt caaacatttg gcaataaagt 1920
 ttcttaagat tgaatcctgt tgcgggtctt gogatgatta ccatataatt tctgttgaat 1980
 taagtttaag atgtaataat taacatgtaa tgcctgaagt tatttatgag atgggttttt 2040
 atgattagag tcccgcaatt atacatttaa taaggatag aaaaacaaat atagcgcgca 2100

aactaggata	aattataggg	aggggtgta	tatatgttao	tagatogaat	taattccagg	2160
aggtgaaggg	aatocaggtg	ttgcccgtot	caatgggtgaa	aagaaaaaao	accccagttc	2220
attaaaaaag	tcogcaatgt	gttatttaagt	tgtctaaagcg	toaatfttgtt	tacacccacaa	2280
tatatccgtg	caacagccag	ccaaatagctc	cccgacccggc	agctcggccac	aaaaatcacaa	2340
ctcgatatab	gtagcccatc	agtccggggac	gggttagcg	ggagagccgt	tgttaaggccg	2400
cagacttttg	toatgtttac	gatgctattc	ggaaagaaocg	caactaagct	gcgggggtttg	2460
aaaaacggat	gatctcggcg	agggtagcat	gttgatttga	acgatgacag	agcgtttgctg	2520
ctgtgtgato	aatatcatct	ccctcgccaga	gacccgaatt	atcagcttcc	ttatttcattt	2580
ctcgcttaac	cgtgacaggg	tgtcgatctt	gagaaatctg	ccgacataat	aggaatatcgc	2640
tggataaagg	cgtgagggaa	gctgagtgga	gctattttctt	tagaagtgaa	cgttgacgat	2700
gtcgagggat	cttttcogct	gcataaacctt	gcttcgggggt	cattatagcg	atttttttcgg	2760
tatatccatc	ctttttcoga	cgatatacag	gatttttgcca	aagggttcgt	gtagaactttc	2820
cttgggtgat	ccaaocggcgt	cagccggggca	ggatagggtga	agtaggcccca	cccgccagagcg	2880
ggtgttccct	cttcaactgtc	ccttatttcgc	acctgggggtt	gctcaacggcg	aatccctgctc	2940
tgcgagggctg	gcgggctaac	gcgggctgaa	cagatgaggg	caagccgatg	gctgatgaaa	3000
ccaaagccaac	caggggtgat	gctgcacaa	tactgattta	gtgtatgatg	gtgttttttga	3060
ggtgctccag	tggctttctgt	ttctatcagc	tgtccctcct	gttcagctac	tgaocggggtg	3120
gtcggttaacg	gcacaaagcac	cgcgggacat	cagcgctatc	tctgctctca	ctgcggtaaaa	3180
acatggccac	tgcagttcac	ttacacccgt	tctcaacccc	gtacgaccca	gaaaaatcatt	3240
gatatggcca	tgaatggcgt	tggatgcggg	gcaacacccc	gcattatggg	cgttggccctc	3300
aaacacgattt	taactcaatt	aaaaaaactca	ggccgcagtc	ggttaacctcc	cgcataacagc	3360
cgggccagtg	cgtcatcgtc	tgcggggaaa	tggacgaaca	ctggggcttat	gtcggggctta	3420
aatccgucaca	gcgtcgctcg	ttttacgcgt	atgacactct	ccggaaagacg	gttgtttgcgc	3480
acgtatctcgg	tgaacgcact	atggcgaccc	tgggggtctc	natgagctctg	ctgtcacccct	3540
ttgacatcgtt	gatatggatg	acggatggct	ggccgctgtg	tgaatccgc	ctgaaggggaa	3600
agctgcacgt	aatcagcaag	cgatatacgc	acgcgaattga	ggcgacataac	ctgaactctga	3660
ggcagccact	ggcagcgtcg	ggaocggaagt	cgcgttcgtt	ctcaaaatcg	gtggagctgc	3720
atgaacaaagt	cacgcggcat	tactgcaaca	taaaacacta	ccaatagctt	ggagtcatca	3780
ccaaacccagg	aagggtgagc	caactatcaa	ggtgtactgc	cttccagacg	aaocgaagagc	3840
gactgagga	aaggcgtcg	ggcccgccat	gagctctctg	gcctacctgt	tggccgttcgg	3900
ccagggtctac	aaaatccagg	tggtcgttga	ctatgagcac	gtccgcagag	tggccgtctat	3960
caatggcgac	ctggggccgc	tggggcgccat	gctgaacctc	tggctccacg	acgacccgga	4020
cacgctcgcg	ctcgggtgat	ccacgatcct	cgcctctgtg	gcgaagatcg	aagagaaagca	4080
ggacagctct	ggcaaggtca	tgatgggcgt	ggtccgcgcg	agggccagagc	catgactttt	4140
ctagccgtca	aaaocggccg	gggtgctcgt	tgatggccaa	gcacgtcccc	atcggtccca	4200
ccaagaagag	cgacttcgcg	gagctggctat	tctgtccagg	caagattcgg	aataccaaat	4260
acgaiaagga	cggccagagc	gtctacggga	cgaactccat	tgcgcataag	gtggatttat	4320
tggacaccaa	ggcacccagc	gggtcaaatc	aggaataagg	gcacattgca	ccggcgttag	4380
tccgggtcaat	cccgcaaggga	gggtgaatga	atcggaactt	tgaocggaaa	gcataccagc	4440
aagaaactgat	cgaocggggg	ttttccgcgc	aggatgcoga	aaacatcgca	agccgcaccc	4500
tcactgcgtgc	gcocccgcgaa	accttccagc	ccgtcggctc	gatgggtccg	caagctatgg	4560
ccaaatccga	gcgcgacagc	gtgcacactg	ctcccccctg	ctcgcgcgcg	ccatccggcc	4620
ccgtggagcg	ttcgggtcgt	ctogaacag	aggggtccag	tttggcgaa	togatgacca	4680
tgcacacgcg	aggaactatg	acgacccaga	agcgaaaaac	cgccggtcag	gaactggcaa	4740
aacaggtcag	cagggccaa	cagggccgct	tgttgaaca	ccggaagcag	cagatcaagg	4800
aaatgcagct	ctccttgctt	gatattgcgc	cgtggccgga	ccgatgcga	gcgatgcaca	4860
acgaacagcg	ccgctctgcc	ctgttccaca	cgggaacaaa	gaaaaatccg	cgcgagggcg	4920
tgcacaaacaa	ggctcatttt	caactcaaca	aggaactgaa	gatcacctac	acccggctcg	4980
agctgcggcg	cgaacgatgac	gaactgctgt	ggtagcaggt	gttggagtaa	gcgaagcgca	5040
ccoctatccg	cgaacgatc	accttcaact	tctacagagct	ttgcacggac	ctgggttggt	5100
cgatcaatgg	ccggtattac	acgaaggcgc	aggaatgcct	gtcgcgccta	cagggcacgg	5160
cgatgggctt	cacgtccgac	cgcgtttggc	acctggaatc	ggtgtcgtcg	ctgcacccgt	5220
tcogctctct	ggacccgtgc	cccttgcaca	cccttgcaca	ggtctcgatc	gacgagggaaa	5280
tctcctcgct	gtttgctggc	gaccaactca	cgaaatccat	atgggagag	tacccgaagc	5340
tgtcccgac	ggcccgacgg	atgttcgaact	atttcagctc	gcacccggag	ccgtacccgc	5400
ccaagctgga	aaacttcgcg	ctcatgtgcg	gatcggatcc	caaccccgctg	aagaaagtggc	5460
gcgacaggg	cggcgaaagc	tgcgaagagt	tgcgaggaag	cggccctgggtg	gaaacacgct	5520
gggtcaaatga	tgaactgggtg	cattgcacaa	gctagggcct	tgtggggctca	gttccgggctg	5580
gggggtccagc	agccagcgct	ttactggcat	ttcaggaaca	agcgggcaact	gctcgaacga	5640
cttgcttcgc	tcagtatcgc	tccgggaacga	cggcgccgct	taacgaactgc	cgataaacag	5700
aggattaaaa	ttgacaattg	tgattaaagg	tcagattcga	cggcttggag	cggccgacgt	5760

gaaggatttc	gaagagatcc	gattgttogg	catgaagaaa	gctccagaga	tggtcgggtc	5820
gctttacagag	gaagaggaga	aaaaagccat	gaaggcgttc	gctgaacagt	tgagagatgc	5880
gatggatttc	ggagcttaca	tggacggcga	gatcattggg	ctgttgggtt	tcaaacagga	5940
gaacggcccc	gaagacgctc	acaaagggca	tctgtccggc	gttttctgtg	agcccgaaac	6000
gaagggccga	ggggttggcg	gtatgttggc	gaaggtgttg	ccggcggttt	tatgtgttgt	6060
gatgatcgcc	agacagattc	caacgggaat	ctgggtggatg	ggcatctcca	tcttcggcgc	6120
acttaatatc	tggctatttc	ggagcttggc	gtttattttg	gtctaacggc	tgccggcgcg	6180
ggttcggggc	aggttagggc	ctgttcgggc	gctgatggtc	gtgttccatc	ctgcggcttc	6240
gctaggtagc	cogatacgat	tgatggcggt	cccgaggagt	atttgcgga	ctgcggcggt	6300
ggcggtgttg	gtgttgacac	caaacgcgag	ctgagatcct	gtcggcgctc	cagcgggcct	6360
ggcgggggcg	gtttccatgg	cggttcggaac	gctgctgaac	cgcaagtggc	aacctcccggt	6420
gctctcgctc	accttttaocg	ccctggcaact	ggcgcccgga	ggaactctgc	tggttccaggt	6480
agcttttagtg	ttcgataccg	caatcccgat	gcttacagga	accaatgttc	tgggcttggc	6540
gtggcttcggc	ctgatcggag	cggttttaac	ctacttccct	tggttccggg	ggatcttcgg	6600
actcgaaact	acagttgttt	cccttaactgg	ctttctcagc	cggtgatggc	ctaagaagct	6660
atgtcccgcc	atcttccatc	gggtgtgtga	ataccgcaca	gatgcgtaag	gagaaaaaac	6720
cgnatcaggg	gctcttccgc	ttcctcgctc	actgactcgc	tgcgctcggt	cggttcgggtg	6780
cgccgagggc	tatcagctca	ctcaaaaggc	gtaatacggc	tatccacaga	atcaggggat	6840
aaacgagggaa	agaacatgtg	agcaaaaagg	cagcaaaaagg	ccaggaaacg	taaaaaggcc	6900
gogtttctgg	cggttttcca	taggtccgcg	ccccctgacg	agcatccaca	aaatcgagcg	6960
tcaagtcaga	ggtggcgaaa	cccgacagga	ctataaagat	accaggcggt	tccccctgga	7020
agctccctcg	tgctctctcc	tggtccgacc	ctgcgcgtta	ccgcatactc	gtccgccttt	7080
ctcccttcgg	gaagcgtggc	gctttctcca	tgctccagct	gtaggtatct	cagtttcgggtg	7140
taggtcgttc	gctccaaagc	gggtgtgtgt	caacgaacccc	cogtctagcc	cgaacgctgc	7200
gccttatccg	gtaactatcg	tcttgagtcg	aaacccggtaa	gacacgaact	atcgccactg	7260
gcagcagcca	ctggttaacag	gatttagcaga	gcgaggtatg	taggcgggtc	tacagagctc	7320
ttgaagtggc	ggcctaacta	cggctacact	agaaggacag	tatttggtat	ctgcgctctg	7380
ctgaagccag	ttaccttcgg	aaaaagaxtt	ggtagctctt	gatccggcaa	acaaaccacc	7440
gctggtagcg	gtgggttttt	tggttgcaag	cagcagatta	cgcgcagaaa	aaaaggatat	7500
caagaagatc	ctttgatctt	ttctacgggg	tctgacgtct	agtggaaaga	aaactcacgt	7560
taagggaattt	tggtcatgag	attatccaaa	aggatcttca	ccctagatcct	tttaaatata	7620
aatgaagtt	ttaaatcaat	ctaaagtata	tatgagtaaa	cttggctcga	cagttaccac	7680
tgcttaatca	gtgaggccac	tatctcagcg	atctgtctat	ttcgttccac	catagttggc	7740
tgactccccc	tctgttagat	aaatcagata	cgggagggct	tactatctgg	ccccagtgct	7800
gcaatgatac	cgcgagaccc	acgtccacgc	gctccagatt	tatcagcaat	aaaccagcca	7860
gcgggaaggc	cgcagcgcag	aaagtgttct	gcaactttat	ccgcctccat	ccagctctatt	7920
aaacaagtgg	cagcaaacgga	ttcgcaaaac	tgctacgcct	cttgtgcaca	aagccgcgcg	7980
aggttttgog	tccgtgtgac	caaggcgttag	ggctcatatg	aagatttcgg	tgatccctga	8040
gcaggtgcog	gaaacatttg	atgtcgajaa	ccatttcatt	gttcgtgaag	tgttcgatgt	8100
gcactctatc	gaaccaaggct	ttgaactatc	taccagaagt	gtgagccctc	accggaagga	8160
ttacatctcg	gatgatgact	ctpatqaaga	ctctgcttgc	tatggcgcat	tcatcgacca	8220
agagcttctc	gggaagattg	aatccaaatc	aaatggaaac	gatctagctc	ctatcgaaac	8280
catctctctg	tcgcacacgc	accgaggcaa	aggaactcgc	cacagctctca	tcaattttgc	8340
gaaaaagtgg	gcactaagca	gacagctcct	tggcatacga	ttajagacac	aaacgaacaa	8400
tgtactcgcc	tgcgaatttg	acgcaaaatg	tggtttact	ctcggcgcca	ttgacctgtt	8460
cacgtataaa	actagacctc	aaatctcgaa	cgaacacagg	atgtactggt	actggttctc	8520
gggagcacag	gatgaacgct	aaacaattcat	tcaagccgac	accgcttcgc	ggcgcggtct	8580
aattcaggag	ttaaaratca	tgagggaagc	ggtgatccgc	gaagtatcga	ctcaactatc	8640
agaggtagtt	ggcgtcatcg	agcgccatct	cgaaccgaag	ttgctggccg	tacatttgta	8700
cggctccgca	gtggatggcg	gctgaagcc	acacagtgat	attgatttgc	tgggttacgg	8760
gacccgaagg	cttgatgaaa	caacgcggcg	agcttttgat	aacgaccttt	tggaaaacttc	8820
ggcttcccc	ggagagagcg	agattctccg	cgtcgtagaa	gtcaaccattg	ctgtgcacga	8880
cgacatcatt	cgtggcgctt	atccagctaa	cgccgaactg	caatttggag	aatggcagcg	8940
caatgacatt	cttgcaggtc	tcttcgagcc	agccacagatc	gacattgato	tggtatctct	9000
gctgacaaaa	gcaagagaac	atagcgttgc	cttggtaggt	ccagcgcgcg	aggaactctt	9060
tgatccgggt	cctgaacagg	atctatttga	ggcggttaaat	gaaaaccttaa	cgttatggaa	9120
ctcgccggcc	gactgggctg	gggatgagcg	aaatgtagtg	cttaaggtct	ccgcgacttg	9180
gtacagcgca	gtaaccggca	aaatcgcgcc	gaaggatgct	gctgcgcgact	gggcaatgga	9240
ggccttcggc	gcccagttatc	agcccgctcat	aottgaagct	aggcaggtct	atcttggaca	9300
agaaatctgc	ttggcctcgc	ggcgagatca	gttggaaaga	tttgttcaact	acgtgaaaagg	9360
cgagatcacc	aaggttagctg	gcaaaataatg	totaacaant	cgttcaagcc	gacgcgcgctt	9420

gggggggggg	ttttaaactaaa	gggttagaga	ggtgggggag	actatggggg	atctgttgaa	9460
gggtgttcta	gggttggtaa	ttggatagga	atggggggag	gactttgggt	acgtgccaat	9540
gggttttagtg	gatgaaggtc	gttttcccta	tgactacttc	ccatcccaat	agacatttct	9600
ttcagagaaa	taagacaaat	ccataaagaaa	ttacgacaaat	agtccatcaa	atttagacaaa	9660
ctctgagaga	aaatagcata	atagttcata	caatttagac	aatagtggca	acggaaatcg	9720
taaggttata	catagggcaa	atgggtctct	caattttggc	ggctactaag	tcatttgcaa	9780
caatggggaca	acgaactttc	tttccabata	tggaaaaaag	atgtttctaa	ccccaaaaag	9840
gggggggggg	gttttatggg	gcaaaagatgg	gagttttctg	ggggcatttg	tggtcataaaa	9900
tggtcaatttt	tggtttggcc	tgacagataaa	gggttgaaag	atcattgtaac	taagcaaaata	9960
gctgtgtctc	taataaaaaat	ttaggagctt	gggtggcaat	tttgggggtga	gggggttggc	10020
gggggggggg	ggcagccctc	gggggggatgg	gaggccccgg	ttaggggggc	gggaggggtt	10080
gagaaggggg	ggcaccctcc	ttcggggtgc	gggttcacgc	ggcaggggcg	agccctgggt	10140
aaaaaacaaag	tttataaata	ctgggttcaaa	agcagggttaa	aagacagggt	agcgggtggc	10200
gaaaaaacggg	cggaaaaact	tgcaaatgct	gyattttctg	ccgtgtggaa	ggccctcaaa	10260
tggtcaatagg	tggtccctct	atctgtcagg	actctggccc	tcaggtgtca	aggatcgccg	10320
ccctcatctg	tcagtajctg	ggccctccaa	gtgtcaatac	cgcaggggac	ttatccccag	10380
gcttgtccac	atcatctgtg	ggaaaactcg	gtaaaaatag	gggttttggc	cgatttggga	10440
gggtggccag	ctccacjctg	cgggcggaaa	tcagccctgc	ccctcatctg	tcacgcggcg	10500
ggcgggtgag	tcggccctct	aagtgtcaac	gtccggccct	catctgtcag	tgaggggcaa	10560
gttttccggg	aggtatccac	aaacgcggcg	ggcgcccgcg	gtgtctcgca	caagggttcg	10620
acgggcttct	tggtggjttt	gcagggccat	agagcccgcg	cagcccagcg	ggcaggggcaa	10680
ccaggccgggt	gaggttgga	aaagggtcgac	atcttggctg	gttcggatat	ttcgtggag	10740
ttcccgccac	agacccjgat	tgaaaggcgag	atccagccac	tcggjccaga	tcattctgtg	10800
acggjaacttt	ggcggtjgat	gaatggccag	gacttgccc	gaaaagagcg	caagpagatc	10860
acgtattttcg	acagcgctcg	atttggcgac	gaggattttt	cgcgjctggc	ctacgtccgc	10920
gacggcgjttg	agggatcaag	ccacagcagc	ccactggacc	ttctagccga	cccagacpag	10980
ccaaggjgatc	tttttgjaat	gctgctccgt	cgtcaggctt	tcggacgttt	gggtjggtga	11040
acagaagtca	ttatcgtaac	gaatggccag	actcccgagg	ggaacccctg	gggtjgcatg	11100
capatacaaaa	tggaacgaacg	gataaaactt	ttcacggcct	tttaaatatc	cgttatttcta	11160
ataaaacgctc	ttttctctta	ggtttacccg	ccaatatatc	ctgtcaaaaa	ctgatagttt	11220
aaactgaagg	ggggaacaga	caatctgata	atgajgggag	aattaaggga	gtcacgthat	11280
gacccccggc	gatgacgggg	gacaaagcjt	tttaagtttg	gaactgacag	aaacggcaacg	11340
attgaaggag	ccactccagcc	ccaatacgca	aaacjctctc	ccccggcggt	tgcccgatto	11400
attaatgcag	ctggjccagac	aggttttccg	actggaaagc	gggcagtgag	cgcaacgcaa	11460
ttaatgtgag	ttagctcaat	cattagggac	cccaggjctt	acacttttat	cttcgggctc	11520
gtatgtgtg	tggaattgtg	agcggataac	aatttcacac	aggaaacagc	tatgaccatg	11580
attacggcaaa	gctatttagg	tgacactata	gaatactcaa	gctatgcata	caacggcttg	11640
ggaggtctcc	catatcgacc	tycaggcggc	cgtctcgaga	attaattcca	atcccacaaa	11700
aatctpagct	taacagccaca	gttgcctctc	tcagagccaga	atcgggtatt	caacacctct	11760
atatcaacta	ctacgttggtg	tataacggtc	cacatggcgg	tatatacgat	gactgggggt	11820
gtacaaaaggc	ggcaaaaacac	ggcgttcccg	gajttgcaca	caagaaaattt	ggcactatta	11880
cagaggccaag	ajcgagaggt	gacgcgtaca	caacaagtca	ggaaacagac	aggttgaact	11940
tcattcccaaa	agjagaggt	caactcaagc	ccaagagctt	tgctaagggc	ctaacaagcc	12000
caacaaaagca	aaaagccac	tggtccacgc	taggaaccaa	aaggccagcg	agtgatccag	12060
ccccaaaaga	gattctcttt	ggccggjaga	ttacaatgga	cgatttccct	tattcttaag	12120
atctaggaag	gaagttcgaa	ggtjaajgtg	agacactat	gttcacacat	gataatgaga	12180
aggttagcct	cttcaatttc	agaaaagaatg	ctgacccaca	gatgggtaga	jagggttaag	12240
cagcajgtct	catcaagacg	atctaccgca	gtaacaaatc	ccaggagatc	aaataccttc	12300
ccaagaaggt	taaagatgca	gtcaaaaagat	tcaggactaa	ttgcatcaag	aacacagaga	12360
aagacataat	tctcaagatc	agaagtacta	ttccagtatg	gacgattcaa	ggcttgcttc	12420
ataaaaccaag	gcaagtaata	gagattggag	ttcttaaaaa	jgttagttct	actjaatcta	12480
agggcatgna	tggaactata	gattcaaatc	gaggatctaa	cagaaactgc	cgtjaaact	12540
ggcgaaacgt	tcatacagag	tcttttaaga	ctcaatgaca	agaagaaaat	cttcgtcaac	12600
atgggtggagc	acgacactct	ggtctactcc	aaaaatgtca	aagatacagt	ctcagaagac	12660
caaaagggtca	ttgagacttt	tcacacaaag	ataatttcgg	gaaacctctt	cggattccat	12720
tgcccagctc	tctgtcaact	catcgaaaag	acagttagaaa	aggaaaggtg	ctcctacaaa	12780
tgccatcaat	ggcataaaag	aaaggctatc	attcaagatc	ttcttgccga	cagtggtccc	12840
aaaagatggac	ccccacccac	gaggagcacc	gtggaaaaag	aagacgttcc	aaacacgtct	12900
tcacagcaag	tggtattgat	tgacatctcc	actgaactaa	gggatgagcg	acaatcccac	12960
tatctcttgc	aagacccctc	ctctatataa	ggaaagttcat	ttcatttgga	gaggacacgc	13020
togaggctag	catggatctc	ggggccccaaa	taattgatttt	atcttgantg	atagtgacct	13080

gttgggtggca	acaaattggat	gagbaatgct	ttttttataat	gcbaaactttg	tacaaaaaaag	13140
ctgaaacgaga	aactgaaaaat	gatatataata	tcaatatataat	aaatttagatt	ttgcataaaaa	13200
aaacagactac	ataattactgt	aaaaacacaaa	atattccagtc	actatgaatc	aaactacttag	13260
atggtatttag	tgaactgttag	tggacacgaca	gcctttcraaa	tgtttcttggg	gtgatgctgac	13320
caacttagtgc	gacacacagac	cttccaaaatg	ttctttctcaa	agggaaatcgt	cgatatccagc	13380
ctactcgctca	ttgttcctcaa	tgccgttatta	aatcataaaaa	agaaaataaga	aaaaagaggtg	13440
cgagcctcttt	ttttgtgtgga	caaaaataaaa	acatctacact	attcatalaac	gctagtgttca	13500
tagtctctgaa	aatcatctctg	atcgaagaaca	atttcacaaac	tcttataactt	ttctctttaca	13560
agtgtgttggg	cttcactctgg	attttcagacc	tctataactta	ctaaaaagctga	taaaagtctct	13620
gtaattctcta	ctgtatcgac	ctgcagactg	gctgtgtgata	agggagacctg	acattctatat	13680
tccccagaaac	atcagggttaa	tggcggttttt	gatgtcaattt	tgcgggtggg	tgagatccagc	13740
cactttctttcc	cggataaacgg	agacccggcac	actggccata	togggtggtca	tcattgcccga	13800
gctttctatcc	ccacccgggta	tcaccatccg	aagttccacgg	gagacttttat	ctgacagcag	13860
acgtgcaactg	ggcagggggga	tcaccatccg	tgcgccggggc	gtgtcaataaa	tatcactctg	13920
tacatccaca	aacagacgat	aaaggctcttc	tctttttatag	gtgtaaaaact	taaaactgcac	13980
ttcacccagtc	ctgtgtctctg	tcagcaaaaag	agccgttctat	ttcaataaaa	cgggcgacct	14040
cagccatcccc	ttctctgattt	tccgcttttcc	agcggttgggc	acgcagacga	cggtcttctat	14100
tctgcatgggt	tgtgcttaacc	agacccggaga	tattgacatc	atatatgccc	tgagcaactg	14160
atagctgtgog	ctgtcaactg	tcactgttaat	acgctgtcttc	atagcacacc	tctttttgac	14220
atacttcgggg	tagtgccgat	caaagctctca	ttttcgccaa	aagttggccc	agggcttctcc	14280
ggtatcaaca	gggaacccag	gattttattta	ttctcggaag	tgatcttccg	tcacaggttat	14340
ttatttcggcg	caaaagtgcgt	cggttgatgc	tgccaaactta	gtcgactaca	ggtcactaat	14400
accatcttaag	tagttgatttc	atagtgcactg	gatatgttgt	gttttacagc	attatgtagt	14460
ctgttttttta	tgcaaaaatct	aattttaatat	attgatattt	atatcatttt	acgtttctctg	14520
ttcagcttttc	ttgtacaaaag	ttggcatttat	aagaaaagcat	tgcttatcaa	tttgttgcaa	14580
cgaacagggtc	actatcagtc	aaaataaaaat	cattattttgc	catccagctg	cagctcctctg	14640
aggaatttogg	tacccccaat	ggtaaggaaa	taattattttt	cttttttctct	tttagtataa	14700
aatagtttaag	tgatgtttaat	tactatgatt	ataataatat	agttgtttata	attgtgaaaa	14760
aataattttat	aaatatattg	tttacataaaa	caacatagta	atgtaaaaaa	atatgacaag	14820
tgatgtgtaa	gacgaagaag	ataaaaagttg	agagtaagta	tattattttt	aatgaatttg	14880
atcgaacatg	taagatgata	taaggccgggt	aagaggttcc	aaottttcac	ataatgaaat	14940
aagatcacta	ccggcggtat	tttttgajtt	atcgagattt	tcaggagcta	aggaagctaa	15000
aatggagaaa	aaaatcactg	gatataacac	cgttgatata	tcccaatggc	atcgtaaaga	15060
acatttttgag	gcatttcagc	cajttgtctca	atgtacctat	aacacagacc	ttcagctgga	15120
tattacgggc	tttttaaga	ccgtaaaaja	aaataagcac	aagtttttat	cggtctttat	15180
tcacattctt	gcccgcctga	tgaatgtctca	tcgggaattc	cgtatggcaa	tgaaagacgg	15240
tgagctgggtg	atatgggata	gtgttccacc	ttgtttacac	gttttccatg	agcaaaactga	15300
aaogtttttca	tgctctggga	gtgaatacca	cgaacgatttc	cggaagtttc	tacacatata	15360
ttcgcaagat	gtggcggtgtt	acgggtgaaaa	cctggccctat	ttccctaaag	ggtttattga	15420
gaatatgttt	ttcgtctcag	ccaatccctg	gggtgagtttc	accagttttg	atttaaacgt	15480
ggccaatatg	gacaaattct	tggcccccgt	tttcacccatg	ggcaaatatt	atacgcaagg	15540
cgacaagggtg	ctgatgcgcg	tggcgattca	gggtccatcat	gcgctctgtg	atggtcttca	15600
tgtcggcaga	atgcttaattg	aattacacca	gtaactggat	gagtggcagg	gcggggcgta	15660
atcgcggtgga	tccgggtttac	taaaaagccag	ataacagtat	gcgtatctgc	gcgtgatatt	15720
ttcgcggtata	agaatatata	ctgatatgtc	gggcccataa	tagtaattct	agctgggttg	15780
atgaattaaa	tatcaatgat	aaaataactat	agtaaaaaata	agaataaata	aattaaaaata	15840
atattttttt	atgatttaata	gtttattata	taattaaata	tctataccat	tactaaatat	15900
tttagttttaa	aagtttaataa	atattttgtt	agaaatttcca	atctgctttg	aatttatcaa	15960
taaaacaaaat	attaaataac	aagctaaaagt	aacaaaataat	atcaaaactaa	tagaaacagt	16020
aatctaatgt	aacaaaacat	aatctaatgc	taatatataa	aagcgcaaga	tctatcattt	16080
tatatagtat	tatttttcaat	caacattctt	attaattttct	aaataatact	tgtagtttta	16140
ttaaacttcta	aatggattga	ctattaatta	aatgaattag	togaacatga	ataaacaagg	16200
taacatgata	gatcatgtca	ttgtgtttat	attgatctta	cattttggatt	gattacagtt	16260
gggaaattggg	gttcgaaaatc	gataagccttg	gatcctctag	agagctgcag	ctggatggca	16320
aataatgatt	ttattttgac	tgatagtgc	ctgtctgttg	caacaaattg	ataagcaatg	16380
ctttctttata	atgcacaact	tgtacaagaa	agctgaacga	gaaacgtaaa	atpatataaaa	16440
tatcaatata	ttaaattaga	ttttgcataa	aaaacagact	acataatact	gtaaaaacaca	16500
acatatccag	tcactatgaa	tcaactactt	agatggtatt	agtgacctgt	agtgcactaa	16560
gttggcagca	tcaccgcagc	cacttttgccg	cgaataaaaata	ctgtgtgacgg	aaqatcaatt	16620
cgcagaataaa	ataaaactctg	gtgtccctgt	tgataccggg	aagccctggg	ccaaacttttg	16680
gcgaaaaatga	gaogttgato	ggcaactacc	atttcacaaac	tcttataactt	ctctctttaca	16740

```

agtgtgttggg cctcatcttgg atttttcagcc tctatacttta ctaaaacgtga taaagttttct 16800
gttaatttcta ttgtatcgac ttgcagactg gctgtgtata agggagacctg acattttatat 16860
tccccagaaa atcaggttaa tgggtttttt gatgttattt tggcgttggc ttgagatcagc 16920
cactttcttc cggataaagg agacagggaac attggtccata tgggttggta ccatgggtcca 16980
gcttttcttc cggatattga ccacagggtt aagtttcacgg gagaattttat ctgacagcag 17040
aggtgcactg gccaggggga tccaccatccg tggcccgggc ggttcaataa tctcactctg 17100
tacatccaca aacagacgat aaagggtctc ctttttatag ggttaaacct taaactgcat 17160
ttcaccagtc cctgtttctg tcaggcaaaa agcgtttcat ttcaataaaa cggggcgacct 17220
cagccatccc ttcctgattt tccgttttc agcgtttggg aagcagacga cggggttcat 17280
tttgcattgg ttgtgttacc agacccgaga tattgacatc atatatgctt tgagcaactg 17340
atagctgttg ctgtcaactg tcaactgtaat accgtgttcc atagcacacc tttttttgac 17400
atacttttgt ttttgatgca gatgattttc aggaactatga cactagcgta tatgaatagg 17460
tagatgtttt ttttttgtca cacaataaag aggtctgcac ctctttttct tttttttt 17520
tggattttta taaggcattg aggacaatag cgagttaggt ggatacgaag attcogtttg 17580
agaagaacat ttggaagggt gtgggtcgac taagttggca gcacacccg aagaacattt 17640
ggaaggctgt cgggtcgacta cagggtcacta ataccatcta agtagttgat tcatagtga 17700
tgatattgtt ggtgttttaca gtattatgta gtctgttttt tatgcaaaaat ctaattttaa 17760
atatttatat ttatatcatt ttacgtttct cgttcagctt ttttgtacaa agttggcatt 17820
ataaaaaagg attgtctcct aatttgtttg aacgaacagg tcaactatcag tcaaaaataa 17880
atatttattt ggggcccag atccatgcta gctctagagt cctgctttta tgagatatgc 17940
gagagcccta tggatcgatg atatttgctt tcaattctgt tgtgcacgtt gtaaaaaacc 18000
tggcatgtg tagctcagat ccttaccgct gggttcgggt cattctaatt aatatatcac 18060
cgtttactat cgtattttta tgaataatat tctcgttcca atttactgat tgtacctac 18120
tcttttatgt tacaatatta aaatgaaaaa aatatattgt gctgaatagg tttatagcga 18180
catctatgat agagcgccac aataacaaa aattgcgttt tattattaca aatccaattt 18240
tataaaaaag gccagaacgg gtcaaaccta aaagactgat tacataaato ttattcaaat 18300
tttaaaaggg cccagggggt agtatctacg acacaccgag cggcgaaacta ataacgttca 18360
ctgaaggga ctcgggttcc ccgcccgggc gcatgggtga gattccttga agttgagtat 18420
tggcgttcgg ctctacgaa agttaagggc accattcaac ccggtccagc acggcggccg 18480
ggtaaacgac ttgtgtccc gagaattatg cagcattttt ttggtgtatg tgggccccaa 18540
atgaagtga ggtcaaacct tgacagtga gacaaatcgt tgggcgggtc cagggcggaat 18600
tttgggacaa catgtcgagg ctcagcagga cctgcaggca tgcaagctag cttactagt 18660
atpstatatto tatagtgtca cctaaatctg c

```

110 14
 111 59
 112 DNA
 113 Artificial sequence

120
 121 forward primer used for the amplification of 200 and 400 bp CHS fragments

400 14
 pgggacaagt ttgtacaaaa aagcagggtg cactgctaac cctgagaacc atgtgcttc 59

110 15
 111 59
 112 DNA
 113 Artificial sequence

120
 121 reverse primer for amplification of 400 bp CHS fragment

400 15
 tgggaaccact ttgtacaaga aagctgggtc gcttgacgga aggaacggaga ccaagaagc 59

110 16

<211> 59
 <212> DNA
 <213> Artificial sequence

<214>
 <215> reverse primer for amplification of 200bp CHS fragment

<401> 16
 ggggaccact ttgtacaaga aagctgggta ggagccatgt aagcacacat gtgtgggtt 59

<216> 17
 <217> 100
 <218> DNA
 <219> Artificial sequence

<220>
 <221> forward primer for amplification of 100bp CHS fragment

<402> 17
 ggggacaagt ttgtacaaaa aagcaggctg cactgctaac cctgagaacc atgtgcttca 60
 gggggagtat cctgactact acttcgcgat caccaacagt 100

<222> 18
 <223> 100
 <224> DNA
 <225> Artificial sequence

<226>
 <227> reverse primer for amplification of 100 bp CHS fragment

<403> 18
 ggggaccact ttgtacaaga aagctgggta acttctcctt gaggtcggtc atgtgttcac 60
 ggttggtgat gcggaagtag tagtcaggat actcgcctg 100

<228> 19
 <229> 79
 <230> DNA
 <231> Artificial sequence

<232>
 <233> forward primer for amplification of 50 bp CHS fragment

<404> 19
 ggggacaagt ttgtacaaaa aagcaggctg cactgctaac cctgagaacc atgtgcttca 60
 gggggagtat cctgactac 79

<234> 20
 <235> 79
 <236> DNA
 <237> Artificial sequence

<238>
 <239> reverse primer for 50 bp CHS fragment

<405> 21

ggggaccact ttgtacaaga aagctgggtg tagtcaggat acttcggctg aagcacatgg
tttcagggtg tagcagtg

60
10

<210> 21
<211> 54
<212> DNA
<213> Artificial sequence

<220>
<221> forward primer for amplification of the 25 bp CHS fragment

<400> 21
ggggacaagt ttgtacaaaa aagcaggctg caatgctaac cctgagaacc atgt

54

<210> 22
<211> 54
<212> DNA
<213> Artificial sequence

<220>
<221> reverse primer for amplification of the 25 bp CHS fragment

<400> 22
ggggaaccact ttgtacaaga aagctgggtg catggttctc agggttatga gtgc

54

<210> 23
<211> 17862
<212> DNA
<213> Artificial sequence

<220>
<221> acceptor vector pHELLSGATE4

<400> 23
ggggcaacta gtgatatccc ggggccatgg cggccgggag catgcgaagt cgggccccat 60
tggccctata gtgagtctga ttacaattca ctggccgtcg ttttacaacg tctgtactgg 120
gaaaaccctg gcgttaacca acttaatcgc cttgcagcac atcccccttt cgcagctgg 180
tgtaatatgg aagaggcccg caacgatcgc ccttcccaac agttggcgag cctgaatggc 240
gaatggaaat tgtaaaagt aatgggtttc tggagttaa tgagstaag acatacgtca 300
gaaccatta ttgcgcgttc aaaagtgcgc taaggtcact atcagctagc aaatatttt 360
tgttaaaaat gctccactga cgttccataa attccccctg gtatccaatt agagtctcat 420
atttactctc aatccaaata atctgcaatg gcaattacct tatccgcaac ttctttacct 480
atttccgccc ggatccgggc aggtttctcg gccgcttggg tggagagggt attcggctat 540
gaatgggcac aacagacaat cggctgctct gatgcgcgcg tgttccgggt gtcagcgcag 600
cgggcgcgcg ttctttttgt caagaccgac ctgtccgggt ccttgaatga actgcaggac 660
gaagcagcgc ggtatctgtg gctggccaag acgggcgttc cttgcgcagc tgtgtctgac 720
gttgtcactg aagcgggaag ggaatggctg ctattggcg aagtgcgcgg gcaggatctc 780
ctctcatctc accttgcctc tgcgagaaa gtatccatca tggctgatgc aatgcggcgg 840
ctccatacgc ttgatccggc tacctgcoca ttccaccacc aagcgaaca togcacgag 900
cgatcaatga ctggatgga agccggtctt gtcgatcagg atgatctgga cgaagagcat 960
caggggtctg cgcagcgcga actgttccgc aggtccaagg cggccatgcc cgaaggcgcag 1020
gatctcgtcg tgaccatggc cgatgcctgc ttgcgaata tcatggtgga aaatggcgcg 1080
tttctgggat tcatcgactg tggcgggtg ggtgtggcgg accgctatca ggaatagcg 1140
ttgtctaccc gtgatattgc tgaagagctt ggccggcgaat gggctgacccg cttcctcgtg 1200
ctttacggtg tggccgctcc cgattcggag cgcctcgcc tctatcgcc tcttgacgag 1260
ttctctgag cgggactctg gggttcgaaa tgacgaccca agcgaagccc aacctgccat 1320
cagcagattt cgattccacc ggcgccttct atgaaaggtt gggcttcgga atcgttttcc 1380
gggaacgcgg ctggatgata ctccagcgcg gggatctcat gctggagttc ttccgcaacc 1440

ccgatccaa	aattacgtt	gaaacgtcca	agagcaata	gaacacgaac	gcgggaaggt	1500
tgccgagag	tgaggatgg	gtctcaatta	tctcttgag	gaatgcaatg	atgaatatga	1560
taatgactat	gaaactttga	ggaataactg	cttagcaacg	taacctcata	aggtgcatca	1620
tgatgacgt	gacaaatgg	aaacatcgta	ttttctgaa	gaattatgct	cggtggagga	1680
tcttcggca	attgacgta	tgcaaacat	gaaactaccc	ctcaggaatg	cattcatcaa	1740
tattattcat	gcccggaaa	gcaagattaa	tccaaactgg	aaatcatcca	gctgatttgg	1800
taacttcagt	tccagcgact	tgattcgctt	tggtgctacc	caagttttca	ataaggacga	1860
gatggggag	taaaagaagg	gtgcgtogaa	gcagatcggt	caaaactttg	gcaataaagt	1920
ttcttaagat	tgaatcctgt	tgccggtctt	ggatgatta	tcataataat	tctgttgaat	1980
taagtttaag	atgtaataat	taacatgtaa	tgcatgaagt	tatttatgag	atgggttttt	2040
atgattagag	tcccgcaatt	atacatctaa	taagcgatag	aaaaaaaaat	atagcgcgca	2100
aactaggata	aattatogcg	cgcggtgtca	tctatgttac	tagatogaat	taattccagg	2160
cggtgaagg	caatcagctg	ttgcgcgtct	cactgggtgaa	aagaaaaaac	accccagtao	2220
attaaaaaog	tcggcaatgt	gttatataagt	tgtctaaagc	tcaatttgtt	tacaccacaa	2280
tatatcctgc	caccagccag	ccaaacagctc	cccgacccgc	agctcggcac	aaaatcacca	2340
ctcgatacag	gcagcccatc	agtcggggac	gjcgtccagc	ggagagccgt	tgtaaaggcg	2400
cagactttgc	tcattgttac	gatgctatct	ggaagaacgg	caactaaagt	gcggggtttg	2460
aaacacggat	gatctcggg	agggtagcat	gttgattgta	acgaqacag	agcgttgcctg	2520
cctgtgatca	aatatcatct	ccctcgacga	gctcgaatt	atcagcttca	ttatcatttt	2580
ctcgcttaac	cgtgacagga	tgtcgatctt	gagauactatg	ccgaataaat	agpaaatcgc	2640
tggaataaag	cgtcgaggaa	gctgagtgga	gtantttctt	tagaagtga	cgttgaagat	2700
gtcgacggat	cttttcogct	gcataacccct	gcttcggggt	cattatagcg	atnttttcgg	2760
tatatccatc	ctttttcgca	cgatatacag	gattttgcca	aagggttctg	gtagactttc	2820
cttggtgtat	ccaaaggcgt	cagccgggca	ggataggtja	agtaygcaca	cccgagagcg	2880
ggtgttcctt	cttcactgtc	ccttatttgc	acctggcggt	gctcaacggg	aatcctgctc	2940
tgccaggctg	gcgggtctac	gcggcgctaa	cagatgagg	caagcggtatg	gctgatgaaa	3000
ccaaaccaa	caggggtgat	gctgcacact	taactgattta	gtgtatgatg	gtgttttttga	3060
ggtgttcacg	tggtctctgt	ttctatcaga	tgctcctctt	gttcagctac	tgacgggggtg	3120
gctgptaacg	gcacaaagcac	cgcgggacat	cagcgtctat	tctgctctca	ctgcgctaaa	3180
acatggcaac	tgacgtttac	ttacacccgt	tctcaacccg	gtacgcacca	gaaaatcatt	3240
catatggcca	tgaatggcgt	tggtatgcgg	gcacacagcc	gcattatggg	cgttggcctc	3300
aacacgattt	tacgtcactt	aaaaaaactca	ggcggcagtc	ggtaacctcg	cgatacagc	3360
cgggagtgat	cgtcatcgtc	tgcccggaac	tggaacgaac	gtcgggctat	gtcggggtat	3420
aatcgcccca	gcgctggctg	ttctacccgt	atgacagctc	ccggaaagac	gttgttgccc	3480
acgtattcgg	tgaacgcact	atggcgagcg	tgggcgctct	catgagcctg	ctgtccacct	3540
ttgacgtgct	gatatggatg	acggatcgct	ggcgcgtgta	tgaatccccc	ctgaagggaa	3600
agctgcacgt	aatcagcaag	cgatatacgc	agcgaattga	gcggcataac	ctjaatctga	3660
ggcagcaact	ggcagggctg	ggacgggaat	cgtgtgcctt	ctcaaaatcg	gtjgagctgc	3720
atjapaaagt	catcgggcat	tatctgaaca	taaaacacta	tcaataaagt	gcagtcatta	3780
cccaaccagg	aagggtcagc	caactatcaa	ggtgtactgc	cttcacagac	aacgaagagc	3840
gattjagggaa	aaggcgcgcg	cgcccgccat	gagctctctg	gcctaacctgc	tgcccgctcg	3900
ccagggctac	aaaatcacgg	gcgtccttga	ctatgacac	gtccgcagac	tgcccgccat	3960
caatggcgac	ctgggcgcgc	tggtgcgcct	gtgaaaactc	tggttcaccg	acgaaccccg	4020
ccggcgcgcg	ttcgggtgatg	ccacgatcct	gcctctgtgt	gcgaagatcg	aagagaaagca	4080
ggacagagct	ggcaaggtca	tgatggcggt	ggtccgcccg	agjgcagagc	catjactttt	4140
ttagccgcta	aaacggcgcg	gggttjcgcg	tqantgcaaa	gcacgtcccc	atgcgttcca	4200
tcaajagag	cgacttcogc	gagctjgtat	togtgcagg	caagatttcg	aatatcaagt	4260
acgagaagg	cggccagacg	gtctaaggga	cgcacttcac	tgcggataag	gtggattatc	4320
tggacaccaa	ggcaccaggc	gggtcaaatc	aggaataagg	gcacattjcc	ccggcgtjag	4380
tccggjcaat	cccgcaagg	gggtgaatga	atcgagctt	tgacccggaag	gcatacaggc	4440
aagaaatgat	gcacggcgcg	ttttccgcgc	aggatgcga	aaacatcgca	agccgcaccc	4500
ccatgctgct	gcoccccgaa	gtcgaactgg	ccgtccgctc	gatjgttcag	caagctacgg	4560
ccagatcga	gcggacagc	ctcgaaactg	ctcccccctgc	cctgcacccg	ccatcggcctg	4620
ccgtggagcg	ttcggctcgt	ctcgaaactg	agggcgcajg	tttggggaag	tccatgacaa	4680
togacacgcg	aggaactatg	acgaacaaaga	agcgaaaaac	cgccggcgag	gacctggcga	4740
aacaggtcag	cgaggccaaag	caggcccgct	tgcctgaacaa	ccaggaagcag	cagatcaagg	4800
aaatgcagct	ttccttgttc	gatattgcgc	cgtjgcggga	cacpatgcga	ggcatgcaca	4860
acgaacaggg	ccgctctgc	ctgttcacaa	cgcgcaacaaa	gaaaatcccg	cgcgaggcgc	4920
tgcacaaacaa	ggctcattttc	caagtcacaa	aggacgtgaa	gatcaacctac	acccggcgtcg	4980
agctcgggcg	cgacgatgac	gaactgggtg	ggcagcaggt	gttgaggtac	gcgaagcgca	5040
cccttatcgg	cgagccgata	accttcacgt	tctacagact	tggccaggac	ctgggctggt	5100

agatcaaatgg	ccgggtatctac	acgaagggccg	aggaatgact	gtogogoota	caggogagagg	5160
agatggggott	ccggtccgac	aggtttgggg	acotgggaato	ggtgtgogtg	ctgcaacggot	5200
tcogoggtcct	ggacgggtggg	aaagaaaaaggt	ccgggttgca	ggtcctgato	gaagagggaaaa	5240
tgtgtgtgat	gtttgtgtggg	gaactactaca	agaaattcat	atgggagagag	taacggaaagc	5280
tttggggagac	ggcccgagggg	atgttogaat	atttcagotto	gcacggggag	cogtaacccgc	5320
tcagagctggg	aaacttccgc	ctcatgtggg	gatcgggatto	caacggcggtg	aagaagtggg	5360
ggagagcaggt	cggggaagcc	tgogaaagagt	tgogagggcag	cggtctgggtg	gaacacggoot	5400
gggtcaatga	tgacotgggtg	cattggcaaac	gotagggoot	tggtgggtca	gttcogggctg	5440
gggtttcagc	agccaggggt	ttactggcat	ttcaggaaca	agggggcaat	gctogaagca	5480
ctcgcttccg	tcagttatcg	tcgggaagga	cgcgogogoto	taagaaactgc	cgataaaacag	5520
aggattaaaa	ttgacaattg	tgattaaaggg	tcagatttoga	cggtttggag	cgcccgacgt	5560
gcaggattttc	cogcagatcc	gatttgtggg	cctgaagaaa	gotccagaga	tggttcgggtc	5600
cgtttacggag	caagaggaga	aaaagcccat	ggaggggttc	gotgaacgggt	tgogagatgc	5640
cgtggcatttc	ggcgootaca	tcgacggcga	gatcattggg	ctgtcgggtct	tcacacaggga	5680
ggacggccccc	aaggacgctc	acaagggcga	ctctccgggc	gttttcgtgg	agcccgaaaa	5720
ggagggccga	gggttggcgg	gtatgctgct	gggggggttg	cgggggggtt	cattgctcgt	5760
gatgatcgtc	cgacagattc	caacgggaat	ctggtggatg	cgcattctca	tcctcggcgc	5800
acttaatat	tcgtattctc	ggagcttctt	gtttatttcc	gtctacccgc	tgccggggcgg	5840
ggtcggggcg	acgttagggg	ctgtccagcc	gctgatgggt	gtcttcatct	ctgctgctct	5880
gotaggttagc	cogatacgat	tgatggcggt	cctgggggt	atttgogga	ctgogggcgt	5920
ggogctgtttg	gtgttgacac	caaaagcagc	gotaganct	gtcggcgtcg	cagcgggoot	5960
ggcgggggcg	gtttccatgg	cgttgggaac	cgtgttganc	cgaagtggc	aaactccgt	6000
gcctctgtctc	acotttacgg	cctgcaact	ggcgcccgga	ggaattctgc	tcgttccagt	6040
agcttttagtg	tttgatccgc	caatcccgat	gcttacagga	acaaatgttc	tcggcctggc	6080
gtggctccggc	ctgatccggg	cgggtttaac	ctacttccct	tggttcgggg	ggatctggcg	6120
actcgaaact	acagttgttt	ccttactggg	cttctccagc	cgggatggg	ctaagaagct	6160
attgcggcgc	atcttccat	gggtgtgaa	ataccgcaca	gatgcgttag	gagaaaaatac	6200
cgcacagggc	gccttccgc	ttcctcgcct	actjactcgc	tjngctcggg	cgttcggctg	6240
cggcgagggg	tatcagctca	ctcaaggcg	gtaatacggg	tatccacaga	atcaggggat	6280
aacgcaggaa	agaacatgtg	agcaaaaagg	cagcaaaaag	ccaggaaacg	taaaaaaggcc	6320
gggttgctgg	cgtttttcca	taggtctcgg	ccctctgacg	agbatcaca	aaatcgacgc	6360
tcaggtcaga	ggtggcgaaa	cccgacagg	ctataaaagt	acbagggctt	tcacccctgga	6400
agctccctcg	tgcgctctcc	tggtccgacc	ctgcgcctta	ccgataact	gtccgctttt	6440
ctcccttcgg	gaagcggtgc	gctttttcca	tgctacgct	gtaggtatct	cagttcgggtg	6480
taggtcgttc	gctccaagct	ggcctgtgtg	acagaaaccc	cggttcagcc	cgacggctgc	6520
gccttatccg	gtaaactatg	ttttgagttc	aacgggttaa	gacacgactt	atcgccactg	6560
gcagcagcca	ctggtaacag	gattagcaga	ggaggttatg	tagggcggtg	taagaggttc	6600
ttgaagtgt	ggcctaacta	cggctacact	agaaggacag	tatttggtat	ctgcgctctg	6640
ctgaagccag	ttacottcgg	aaaaagagtt	ggtagctctt	gatccggcaa	acaaaaccac	6680
gctcgttagcg	gtggtttttt	tggttgcaag	cagcagatta	cgcgcagaaa	aaaaaggatat	6720
caagcaagatc	ctttgatctt	ttctacgggg	tttgaogctc	agtggaaaga	aaactcacgt	6760
taagggtattt	tggtcatgag	atttatcaaaa	aggatcttca	cctagatctt	ttttaaattaa	6800
aaatgaagtt	ttaaaacaa	ctaaagtata	tatgagttaa	cttgggtctga	cagttaccaa	6840
tgcttaactca	gttaggcacc	tatctcaggg	atctgtctat	ttcgttcctc	catagttcgc	6880
tgaactcccg	tcgtgtagat	aaatccgata	ggggaggggt	taacatctgg	cccgagtgct	6920
gcaatgatac	cgcagagccc	acgtccacgg	gctccagatt	tatcagcaat	aaacacggca	6960
ggcggaaggg	cgcagggcag	aaagtgtcct	gcaactttat	cggctccat	ccagttctatt	7000
aaacaaagtgg	cagcaacggg	ttcgcaaac	tgtaacgoot	tttgtgcaaa	aagcggcgcc	7040
agggtttcgja	tcogctgtgc	cagjcgtnag	gggtccatag	aagatttcgg	tgatccctga	7080
gcaggtggcg	gaaacattgg	atgtcgagaa	ccatttccatt	gttcgtgaag	tggttcgatgt	7120
gcacccatcc	gaccaaaggct	ttgaaactatc	taacagaagt	gtgagccoot	accggaaggga	7160
ttapatctcg	gatgatgaat	ctgatgaaga	ctttgcttgc	tatggcgcat	tcactgaacca	7200
agagcttggtc	gggaagattg	aaactcaactc	aaatgggaac	gatctagoot	ctatcgaaaca	7240
cattgtttgtg	tcgtaacgcg	acogagjbaa	agtagtcggg	caagctcca	tcgaatttgc	7280
gaaaaagtgg	gcaataagca	gacagctcct	tgcaatacga	ttagagacac	aaaagaaaca	7320
tgtaactgoc	tgcaatttgt	acgcaaaatg	tggttttaact	ctggcgjga	ttgacotgtt	7360
cacgtataaaa	actagacootc	aagtctcgaa	cgaaaacagc	atgtactggg	actggttctc	7400
gggagccacag	gatjacgoot	aaacattcact	tcgaagccag	acogcttcgc	ggcggggctt	7440
aattcaggag	ttaaaacatca	tgagggaagc	gggtgatccg	gaagtatoga	ctcaactatc	7480
agaggtagtt	ggcgccatct	agcgccatct	cgaaacagag	ttgctggcgg	taactttgta	7520
cggctccgca	gtggatggcg	gcctgaagcc	acacagtgat	attgatttgc	tggttaagggt	7560

gacogtaagg	cttgatgaaa	caacaggggg	agottttgato	aaogaaotttt	tggaiaaottt	8520
ggotttobott	ggagagaggg	agatttotoog	ggotgragaa	gtcacoattg	ttgtgcaoga	8530
ggacatcatt	gggtgggggt	atocagotaa	gggggaattg	caatttggag	aattggcaog	8540
caatgacatt	cttgcaaggt	tottogagoo	agccagagat	gacattogato	tggotatott	8550
gttgacaaaa	gttagagaaa	atagggtttg	tttggttaggt	ccagcggggg	aggaaactott	8560
tgatocgggt	cttgaaagag	atctatttga	ggogotaaaa	gaaacottaa	agctatggaa	8570
ctoggggggg	gactgggggt	ggatggaggg	aaatgttagt	cttaogttgt	ccggattttg	8580
gtacagggga	gtaaocggga	aaatoggggg	gaaggtatgt	gctggcgaat	gggaattgga	8590
gggggtgggg	ggccagttat	agccgttcat	aottggaagot	aggcaggggt	atottggaca	8600
agaagattog	ttggccttgg	ggcagatcaa	gttggaagaa	tttgttcaat	acgtgaaagg	8610
cgagatcacc	aagggtagttg	gcaaatcaatg	ctttaaacaatt	cgtttaagcc	gaogccgggt	8620
cggggggggg	cttaactcaa	gggttagaga	gctgggggaag	actatggggg	atctgttgaa	8630
gggtgggttota	agootogttac	ttgggatggg	atogggggcag	gcaontgtgt	aactggcaat	8640
tggttttagtg	gatgaagctc	gttttcccta	tgaactactcc	ccatccaact	acgacatttc	8650
tccaagcaac	taagacaact	ccataagcaa	ttacgacaat	agtcocatcaa	attacpaaaa	8660
ctctgagagg	aaatacgata	atagtttcat	caattargac	aatagtogca	acggaaatog	8670
taggotttata	tatagggcaa	atgggtctog	caactttcgc	ggctaactacg	tcattggcaa	8680
caatggggaca	acgaactttc	tttccacatc	tggaacaaagg	atgtttctaca	ccccaaaagg	8690
gggggggggg	gtctatgggg	gcaaaagatgg	gagottttgc	ggggcattgg	ttgtctcaaa	8700
tggccaatttt	tggccttggcc	tgacagataa	cggcctgaag	atcatgtatc	taagcaacta	8710
ggctgctctc	taataaaaatg	ttaggagctt	gggtgcnatt	ttcgggggtga	ggcggnttgc	10120
ggccgagggg	cgcagccctc	ggggggatgg	gaggccctgg	ttagcggggc	gggaggggtc	10130
gagaaggggg	ggcaccoccc	ttcggcggtc	gcggtcacgc	ggcagcgggc	agccctgggt	10140
aaaaaacagg	tttataaata	ttggtttaaa	agcaggctaa	aagacagggtt	agcgggtggc	10150
gaaaaacggg	cggaaaacct	tgcaaatgct	ggattttctg	ctgttgagaa	ggccctcaaa	10160
tgtaaatagg	tgcccccctc	atctgtccgc	actctggccc	tcaagtgtca	aggtatgggc	10170
ccctcatctg	tcagtagttg	cggccctcaa	gtgtcaatac	cgcagcggac	ttatccccag	10180
gcttggctcac	atcatctgtg	ggaaaactgc	gtaaaactag	gggttttgcg	cgtattggga	10190
ggctggccag	ctccacgttg	ccggccgaaa	togagactgc	ccctcatctg	tcacaggggc	10200
gpcgggtgag	tggcccccct	aagtgtcaac	gtccgcctct	catctgtcag	tgaggggcaa	10210
gntttccggc	aggtatccac	aacgctggcg	ggcggccggg	gtgtctcgca	caagggtttg	10220
agggcggttt	tggcgcggtt	gcaggcccat	agacggccgc	cagcccgagc	ggaggggcaa	10230
ccaggccggg	gagcgtcgga	aagggtcgac	atctgtctgc	gttgggatat	ttctgtggag	10240
ttcccgccac	agacccggat	tcaagcgtag	atccagcaac	tccggccaga	tcactctgtg	10250
agggaaattt	ggcgcggtgat	gactgtccag	gacgtcggcc	gaaagagcga	caagccagatc	10260
agatttttgc	acagcgttgg	atttgcgctc	gaagattttt	cggcggtggc	ctacgtccgc	10270
gaocggttg	agggatcaag	ccacagcgag	ccactcgacc	ttctagccga	cccagacgag	10280
ccaagggtat	tttttggaat	gctgtctcgt	cgtcagggtt	tcogaagttt	gggtgggttga	10290
acaiaagtca	ttatcgtacg	gaatcccgag	actcccgagg	ggaacctgtt	ggttggcattg	10300
cacatacaaa	tggacgaacg	gataaacctt	ttcaggccct	tttaaatatc	ggttattcta	10310
ataaacgctc	ttttctctta	ggtttabccg	ccaatatata	ctgtcaaaaca	ctgatagttt	10320
aaactgaagg	cgggaaaacga	caatctgac	atgaaggagg	aatttaaggga	gtcaggttat	10330
gaccccgccg	gatgaocggg	gacaagccgt	tttaagtttg	gaactgacag	aaocgcaacg	10340
attgaaggag	ccactcagcc	ccaatacgca	aaccgctctt	ccccggcggt	tgcccgattc	10350
attaatgcag	ctggcagcag	aggtttcccg	actggaaaagc	gggcagtgag	ggcaacgcaa	10360
ttaatgtgag	ttagctcact	cattagpcac	ccbagccttt	acactttatg	cttccggctc	10370
gtatgtttgt	tggaaattgt	ajcggtatac	aatttcacac	aggaaaacagc	tatgacatg	10380
attacggccaa	gctatttagg	tgacactata	gaatactcaa	gctatgcata	caacccgttg	10390
ggagctcttc	catatcgacc	tgcaggcggc	ggctogagga	attaattcca	atcccaaaaa	10400
aatctgagct	taacagpcac	gttgcctctc	tcagapcaga	atcgggtatt	caacacccctc	10410
atatcaacta	ctacgttgtg	tataacgggc	gagttgcaca	tatatagcat	gactgggggt	10420
gtacaaaagg	ggcaacaaac	ggcgttcccg	caacaagcca	caagaatttt	gccaactatta	10430
cagaggcaag	agcagcagct	gacgcgtaca	ccaagagctt	gcaaacagac	aggttgaact	10440
tcactcccaa	aggagaagct	caactcaagc	taggaaacca	tgctaaggcc	ctaacaagcc	10450
caccaaagca	aaaagccccc	tggtcraagc	ttacaattga	aaggcccgag	agtgatccag	10460
ccccaaaaga	gatctccctt	ggcccgagga	gttaacactat	cgatttccct	tatcttcaag	10470
atctaggaag	gaagttcgaa	ggcgaagggt	acgacactat	gttcaacact	gataatgaga	10480
aggttagcct	cttcaatttc	agaaaagaatg	ctgacccaca	gaggtttaga	gaggtctacg	10490
cagcaggtct	cataaagaag	atctaacccga	gtacacaatct	ccagagagatc	aaataacttc	10500
ccaagaagggt	caaaagatgca	gtcaaaaagat	tcaggactaa	ttgcatacaag	aacacagaga	10510
aaagacatatt	tctcaagatc	agaagtaacta	ttccagtatg	gacgattcaaa	ggcttgcttc	10520

ataaaacaaag	gaaagttaata	gagattggag	tatttaaaaa	ggtagtttct	actgaatcota	12480
aggccatgca	tggagtctaa	gattcaaatc	gagatcttaa	cagaaactogo	agtgaagact	12840
ggcgaacagt	tcatacagag	tatttttaaga	ctcaatgaca	agaagaaaaat	cttcgtcaaac	12600
atgggtggag	agacacattc	ggtctacttc	aaaaatgtca	agataacagt	ctcagaagag	12660
caaaagggcta	tggagatttt	tcacacaaagg	ataatttcgg	gaacactctc	gggattccat	12720
tgcacagcta	tctgtcattc	catacgaagg	agatagaaaa	aggaaggttg	ctcctacaaa	12780
tgcacatcatt	ggataaaag	aaagggtatc	attcaagatc	tctctgcaga	cagtggtccc	12840
aaagatggac	ccccacccac	gaggagcatt	gtgaaaaaag	agacagtctc	aaacacgtct	12900
tcacagcaag	tggattgatg	tgacatctcc	actgaagtta	gggatgacgc	acaatccac	12960
tatctcttgc	aagacccctc	ctctatatata	ggaggttctc	ttcatttgga	gaggacacgc	13020
togaggtctag	cattggattc	gggccccaaa	caatgatttt	attttgaactg	atagtganct	13080
gttcgttgca	acaaattgat	gagcaatgot	tttttatatt	gcacactttg	tacaaaaaag	13140
ctgaacgaga	aacgtaaaaa	gatataaata	tcaatatatt	aaattagatt	ttgcataaaa	13200
aacagactac	ataatactgt	aaaacacac	atatccagtc	actatgaatc	aactacttag	13260
atgggtattag	tgacctgtag	tgcaccgaca	gccttccaaa	tgttctctgg	gtgatgctgc	13320
caaacttagtc	gacccgacgc	cttcccaaatg	ttctttctca	acggaatctg	cgatccagc	13380
ctactcgcta	ttgtctctca	tgccgtatta	aatcataaaa	agaaaataaga	aaaagaggtg	13440
cgagcctctt	ttttgtgtga	caaaataaaa	acatctacct	attcatatac	gctagtgtca	13500
tagtcttgaa	aatcatctgc	atcaagaaca	atttcacaa	tcttatactt	ttctcttaca	13560
agtggttggg	cttcactctg	attttcagcc	tctatactta	ctaaacgtga	taaagtctct	13620
gtaatttcta	ctctatcgac	ctgcagaactg	gcgtgtgata	agggagcctg	acatttatat	13680
tcacacgaac	atcaggttaa	tggcgttttt	gatgtcattt	tgcgggtggc	tgagatcagc	13740
cacttcttcc	ccgataacgg	agacccggac	actggccata	tgggtggtca	tcattgcgca	13800
gctttctatc	ccgatatgca	ccacccgggt	aagttcacgc	gagactttat	ctgacagcag	13860
acgtgcactg	gcccagggga	tcacccctccg	tgcgcggycg	gtgtcaataa	tatcactctg	13920
tacatccaca	aacagacgat	aaaggctctc	tcttttatag	gtgtaaaact	taaaatgcat	13980
ttcacagctc	ccgtttctcg	tcagcaaaaag	agcgttctat	ttcaataaac	ggggcgacct	14040
cagccatccc	ttctcgattt	tcggctttcc	agcgttcggc	acgcagacga	gggggttctat	14100
tctgpatgtt	tgtgcttacc	agacccggga	tattgacatc	atatatgctt	tgagcaactg	14160
atagctgtcg	ctgtcaactg	tcactgtaat	acgtctcttc	atagcaacac	tctttttgac	14220
atacttcggg	tagtgccgat	caacgtctca	ttttcgccaa	aagttggccc	agggcttccc	14280
ggtatcaaca	gggacacccg	gatttattta	ttctgggaag	tgatcttcgg	tcacaggtat	14340
ttatttggcg	caaggtjggt	cggtgtgctc	tgccaaactta	gtcgactaca	ggtaacnaat	14400
accatctaag	tagttgatcc	atagtactgt	gatattgtgt	gttttacagt	attatgtagt	14460
ctgtttttta	tgcacaaatc	aatttaatat	attgatattt	atatcatttt	acgtttctcg	14520
ttcagcttcc	ttgtacaaag	tggcatttat	aagaaagcat	tgcttatcaa	tttgttgcaa	14580
cgacacaggtc	actatccagc	aaaataaaat	cattatttgc	catccagctg	cagctctctg	14640
aggaatttcg	tacccacagt	tggtaaggaa	ataattattt	tcttttttcc	ttttagtata	14700
aaatagttaa	gtgatgttaa	ttagtatgat	tataataata	tagttgttat	aattgtgaaa	14760
aaataattta	taaatatatt	gtttacataa	acaacatagt	aatgtaaaaa	aatatgacaa	14820
gtgatgtgta	agacgaagaa	gataaaaagt	gagagtaagt	atattatttt	taatgaattt	14880
gatccgaacat	gtaagatgat	atactagcat	tactatttgt	tttaatacata	atagtaattc	14940
tagctgggtt	gatgaattaa	atatcaatga	taaaatacta	tagtaaaaaa	aagaataaat	15000
aaattaaaaa	aatatttttt	tatgattaat	agttatattt	ataattaaat	atctatacca	15060
ttactaaaaa	ttttagtcta	aaagttaata	aatattttgt	tagaaatttc	aatctgcttg	15120
taatttatca	ataaacaaaa	tattaaataa	caagctaaag	taacaaataa	tatcaacta	15180
atagaaacag	taattctaag	taacaaaaaa	taattctaat	ctaataatac	aaagcgcaag	15240
atctatcatt	ttatatagta	ttattttcaa	tcacactctc	tatttaattc	taaaataaac	15300
ttgtagtttt	attaaactct	aaatggattg	actattaatt	aaatgaatta	gtcgacacatg	15360
aataaaacag	gtaacatgat	agatcatgtc	attgtgttat	cattgatctt	acatttggat	15420
tgattacagt	tgggaagctg	ggttcgaaat	cgataagctt	ggatctctct	gagagctgca	15480
gctggatggc	aaataatgat	tttattttga	ctgatagtga	ctgtgttggt	gcaacaaaat	15540
gataagcaat	gctttcttat	aatgcacact	ttgtacaaga	aaggtgaaag	agaaaagctaa	15600
aatgatataa	atatcaaatat	attaaattag	attttgcata	aaaaacagac	tacataatac	15660
tgtaaaaaac	ascatatcca	gtcactatga	atcaactact	tagatgggat	tagtgaactg	15720
tagtcgacta	agttggcagc	atcacccgac	gcaatttgcg	cogaataaat	actgtgacg	15780
gaagatcaat	tgcgagaata	aataaaactc	ggtgtctctg	ttgataccgg	gaagccctgg	15840
gcaaaccttt	ggcgaaaatg	agacgttgat	oggaactacc	catttcacaa	ctcttatact	15900
ttctctctac	aagtgcttctg	gcttcatctg	gattttcagc	ctctataactt	actaaaagctg	15960
ataaaagtct	tgtaaattct	actgtataga	cttgacagact	ggctgtgtat	aagggagcct	16020
gacattttata	ttccccagaa	cactcaggtta	atggcgtttt	tgatgtcatt	ttcggcgttg	16080


```

ctgagatcag ccacttcctc ccgataaag gagacggga caotggccat atcgggtggtc 16140
atcatgggcc agcttcctc ccgatatgc accacgggtt aaaggttcag ggagacttta 16200
tctgacagca gaagtgcatt ggcaggggg atcacccatcc gtggcccgag cgtgtcaata 16260
atatcactct gtacatccac aaacagacga taacggctct ctcttttata gggttaaaaa 16320
ttaaacctga tttccaccgt cctgtgtctc gtcagaaaaa gagccgttca tttccataaa 16380
ccgggagacc ccagccatcc ctctctgatt ttccgctctc cagcgttcgg caagcagagc 16440
acggggttca ttctgcattg ttgtgcttac bagacgggag atattgacat catatatgac 16500
ttgagcaact gatagctgtc gctgtcaact gtcactgtaa taagctgctt catagccac 16560
ctctcttttg catactctct tcttgatgc agatgatttt caggactatg acactagcgt 16620
atatgaatat gtagatgttt tctttttgtc acacaaaaaa gaggctcgca cctctttttc 16680
tctttctctt tcttgattta atacggcatt gaggacaata gogagttagg tggatacagc 16740
gattccgttt gagaagaaca ttgggaaggg cgtcgggtga ctaaggttgg agoatccccc 16800
gaagaacatt tgggaaggct cgggtcgact acagggtcact aataccatct aagtagttga 16860
ttcatagtga ctggatatgt tgtgtttttc agtattatgt agtcgtttt ttatgcaaaa 16920
tctaatttaa tatattgata tttatatcat tttacgtttc tegtccagct tttttgtaca 16980
aagttgcat tataaaaaag cattgctcat caatttggtg caacgaacag gtcactatca 17040
gtcaaatata aatcattatt tggggcccca gatccatgct gatatttgc tccaattctg ttgtgcacgt 17100
atgagatag cgagacgct atgatgcac gatatttgc tccaattctg ttgtgcacgt 17160
tgtaaaaaa ctgagcatgt gtatgtcaga tcttaacggc cgggtttcgg ttattctaat 17220
gaatatata ccggttaact cgttatttt atgaataata ttctcgttcc aatttaactg 17280
ttgtacata ccaattatat gtacaatatt aaaatgaaaa caatarattg tgotgaatg 17340
gtttatagcg acatctatga tagagcgcca caataacaaa caattcggtt ttattattac 17400
aaatccatt ttaaaaaaag cggcagaacc ggtcaaacct aaaagactga ttacataaat 17460
cttattcaaa ttccaaaaag ccccgagggg tagtatctac gacacaacca gcggcgaaat 17520
aataacgttc actgaaggga actccgggtc cccgcgggg ccgatgggtg agattcctg 17580
aagttgagta ttggccgtcc gctctaccca aagttacggg caccattcaa ccgggtccag 17640
cacgggggcc gggtaaccca ctgctgccc cgagaattat gcagcatttt ttgtgtgat 17700
gtggggccca aatgaagtgc agtcaaaac ttgacagtga cgacaaatcg ttgggggggt 17760
ccaggggcaa ttttcggaca acatgtcgag gctcagcagg acctgcagg atgcaagcta 17820
gcttactagt gatgcattt ctatagtgtc acctaaatct gc 17880

```

<110> 24
 <111> 17476
 <112> DNA
 <113> Artificial sequence

<120>
 <121> acceptor vector pHEMISCATE

```

<400> 24
ggcgacata gtgatatccc gggcccatgg cggccgggag catgcgacgt cgggcccacat 60
tcgcctata gtgagtcgta ttacaattca ctggccgtcg ttttacaacg tctgactgg 120
gaaaaccctg gogttaccca acttaanccg cttgcagcac atcccccttt cgcagctgg 180
cgtaatagcg aagaggcccg caccgatcgc ccttcccaac agttgcgcag cctgaatggc 240
gaatggaaat tgtaaaagtt aatgggtttc tggagttaa tgagctaaag acatacgtca 300
gaaaaccatta ttgcgggttc aaaaagtccc taaggtcact atcagctagc aaatatttct 360
tgtaaaaaat gctccactga cgttcacata attcccctcg gtatccaat aga-gtctat 420
attcactctc aatccaaata atctgcaatg gcaattacat tatccgcaac ttctttacat 480
atttcggccc ggatccgggc aggttctctcg gcgccttggg tggagaggct attcggctat 540
gactgggcac aacagacaat cggctctctc gatcccgccg tgttcgggt gtcagcgag 600
gggggcccgg ttcttttctg caagaacgac ctgtccggtg ccttgaatga actgcaggac 660
gagggagcgc ggcctatctg gctggccacg acggggcgtc cttgcgcagc tgtgtcgac 720
gttctcactg aagcgggaag ggaactggct ctattgggcg aagtgcgggg gcaggatctc 780
ctgtcatctc accttgctcc tgcgcagaaa gtatccatca tgcctgatgc aatgcggcgg 840
ctgcatacgc ttgatccggc tacctgcccc ttgcaccacc aagcgaaaca tgcctcgag 900
cgagcaacgta ctccgatgga agccggtctt gtcgatcagg aggtccaaag ccgcgctgcc cgaacggcag 960
caggggctcg cgcacagcca actgttcgoc cgtatccctg ttgcgaata tcatgggtga aaatggcggc 1020
gatctcgtcg tgacccatgg cgtatccctg tggcgaata tcatgggtga aaatggcggc 1080
ttctctggat tcatcagctg tggcggctcg ggtgtggggg acctgatcca ggacatagcg 1140
ttgggtaccc gtgatattgc tgaagagctt gggcggaat gggctgacgg ctctcctgtg 1200

```

otttaagga	togogogot	ogattogog	ogattogoot	totatogoot	tottgaogag	1260
ttottotgag	ogogactotg	ggattogaaa	tgacogacaa	agogaogooo	aaootgoot	1300
baagagattt	ogattogacoo	ogogoottot	atgaaaaggt	ggottotgga	atogtttttt	1340
gggaogggg	ogggatgate	otocagogog	ggatetcat	goggaagtto	ttogoooooo	1400
ogatocaaa	aottacoggt	gaaogtoca	agagcaaat	gaocaggaao	goggaaggt	1500
tgogogagog	tgtggatggo	gtotcaatto	tottttgcau	gaatgcaatg	atgaatatga	1560
taotgaotat	gaaactttga	gggaataatg	ootagcaoo	toabotcata	ogtgcatoca	1620
tgocatgoot	gacaaocatgg	aaocatogora	tttttttgaa	gaattatgot	ogttggagga	1680
tgtogoggga	attgocagora	tgocaaocat	ogaaatcccc	otocagootg	oattcatcaa	1740
tattatcoat	goggggaaaag	gcaagatttaa	toaaaotggg	aaatcatoca	gogtgattgg	1800
taaottcagt	toacagogaot	tgattoggtt	tggtgootao	caogttttca	ataaggaoga	1860
gatgggtgag	taaagaagga	gtgggtogaa	gogagatogtt	caaacatttg	gcaataaagt	1920
ttotttaagat	tgaaatootgt	tgocggtoott	gogatgatta	toatataaatt	totgttgaat	1980
atggttaago	atgtaataat	taacatgtaa	tgcatgaogt	tattcatgag	atgggttttt	2040
atgattagag	toocgcaatt	atacatttaa	taogogatag	aaaacaaaaat	atagogogoa	2100
aaactaggata	aattatogog	ogoggtgtca	totatgttaa	tagatogaat	taattocagg	2160
oggtgaaggg	caatocagotg	ttgocogt	oactgttgaa	aagaaaaaacc	accocagtac	2220
attaaaaaog	toocgaattgt	gttattaagt	tgtttaagcg	toaatltgtt	tacacacaaa	2280
tatatootgo	oacagocooig	oaaacageto	oogacogggc	agotcggcac	aaaatocaaa	2340
otogatacag	goagocooat	agtcogggac	ggogtcaogc	ggagagocgt	tgtaaggocg	2400
cagaactttgo	toatgttaro	gatgotatto	ggaagaacgg	caactaagot	gocgggtttg	2460
aaacacggat	gatotogogg	aggytaicat	gttgattgta	argatgaocg	agogttcctg	2520
oogtgatoca	aatatcatot	oootogcaga	gatocgaatt	atcagootto	ttatnoattt	2580
otogottaac	ogtgacagjo	tgtogatott	gagaactatg	ogacataaat	aggaaatocg	2640
tggtataaago	ogtgagggaa	gotgaggggo	gotatttott	tgaagtjaa	ogttgaogat	2700
gtogacggat	ottttcoogt	gataaoot	gottcoggggt	cattatagog	attttttogg	2760
tatatocato	ottttttga	ogataatacag	gattttgoca	aagggttctg	gtagaatttt	2820
ottggtgtat	oaaacgggtt	oagocgggga	ggataggtja	agtaggocaa	oocggagggg	2880
gggtgttctt	ottcactgtc	otttatoggo	aoctgggggt	gottaaoggg	aatootgtoc	2940
tgogaggotg	gocgggtac	gocgggttaa	cagatjaggg	caaogggatg	gotgatgaaa	3000
oaaagocaa	caggggtgat	gotgocaaot	taotgattta	gtgtatgatg	gtgtttttga	3060
ggtgtctocag	tggttctcgt	ttotatocag	tgtcctoot	gttcagotac	tgacgggtg	3120
gtoggtaaog	gcaaaaagac	ogocggacat	cagogotato	tctgtotoca	otgocgtaaa	3180
acatggcaao	tgcagttcac	ttacacogot	ttoaaocog	gtacggacca	gaaatcatt	3240
gatatggoca	tgaattgggt	tggtocogg	gtaacagoc	gtattatggg	ogttggootc	3300
aaacogattt	taogtcaatt	aaaaaactca	ggocggagto	ggttaootog	ogcatacago	3360
ogggocagga	ogtcatogto	tggocggaaa	tggangaaca	gtgggggtat	gtocgggota	3420
aatocogoca	gogotgggtg	ttttacoggt	atgacagtot	oggaagacg	gttgttgocg	3480
acgtattogg	tgaacgcaot	atggocagjo	tggggogtot	tatgagootg	otgtcactot	3540
ttgacgtggg	gatattgatg	acggatggot	ggoggtgtta	tgaatocog	otgaaggaaa	3600
agotgacogt	aatcajgaag	ogataacjo	agogaattga	ggocataao	otjaattga	3660
ggacagcaot	ggcajgggtg	ggacggaaat	cagotoggtt	otcaaaaatog	gtjgaggtgc	3720
atgacaaagt	catoggggat	tatctgaaca	taaaaacacta	tcaataagtt	ggagtcatta	3780
ooraacbag	aaagggaajo	cacotatocaa	gtgtactgc	ottocagang	aaogaaagag	3840
gattgaggaa	aaaggggggg	ogocggoot	gagootgtog	gottacotgc	tggocogtat	3900
oaggggtac	aaaatocagg	gogtgggtga	otatgagca	gtocggagag	tggocogcat	3960
caatggogac	ctgggogjoc	tgjggjgoot	gotgaaotc	tgjotcaccg	acgacocog	4020
caoggggggg	ttoggtgatg	oacgatoot	ogootgtog	oggaagatog	aagagaagca	4080
ggacagagott	ggcaaggtca	tgatgggggt	gttccggocg	agjgcajag	catjactttt	4140
ttagocogota	aaocggocgg	gggtggjag	togtgcaggg	gacgtocoo	atggogtoca	4200
toaagaagag	ogacttccog	gajotggat	ogacttcat	caagattcgg	aataocaaagt	4260
acgagaagga	ogocagagag	gtctacggga	aggaataagg	tggogataag	gtjgattatc	4320
tggaacocaa	ggcarcaggc	gggtcaaatc	atcgacgtt	gacattggc	ooggggtgag	4380
tojgggcaat	oocgcaaggga	gggtgaatga	aggaatgoga	tgacoggaag	gcatacaggo	4440
aaajaactgat	ogacoggggg	ttttocggog	oggtgggtc	aaoratogca	agocgacocg	4500
toatgggtgo	gococggogaa	aoottocagt	otcogootg	gatgttccag	caagotacgg	4560
oaaagatoga	gocogacagc	gtgcaactgg	otcogootg	ootgocogog	oatogggocg	4620
oogtggagog	ttogogtogg	otogaacag	agggggcagg	tttgjggaag	togatgacca	4680
togacacog	aggaactatg	acgacocaga	agocaaaaac	ogcogggcag	gacotggcaa	4740
aaacgggtcag	ogaggocaaag	caggocgggt	tgtgaaaca	oacgaagcag	cagatocagg	4800
aaatgcagot	ttocoggtto	gatattgogg	ogtgggocgga	oacgatggca	gogatgocaa	4860

agagacagggg	ccgctctctggc	ctgtttcacc	cgcgcaacaa	gaaaaatccg	cgcgagggcg	4920
tgcaaaaacaa	ggtcattcttc	caagtcacaa	aggaactgaa	gataacatac	acggcgctcg	4980
agctgagggg	agagagatgac	gaaactggtg	ggcagcaggt	gttgagagta	gagaaagggca	5040
ccccatctgg	cgagccgatac	acorttcacgt	tctacagaggt	ttgcccaggac	ctggggctaggt	5100
cgatcaattgg	ccgggtattac	aggaaggcgg	aggaattgctt	gtcgcgcccta	gagggcgagcg	5160
cgatggggctt	caagtcacgac	cggtttgggg	acccggaaatc	ggtgtcgctg	ctgcaacgggt	5220
tcggcgctctt	ggacccgtggg	aagaaaaacgt	cccggttgcca	ggtcccgatc	gaagagggaaa	5280
tcgtcgctgct	gttttgctggg	gacccactaca	cgaaatttcac	atgggagaaag	taocgcaagc	5340
tgctcgccgac	ggccccgacgg	atgttcgaact	atttcagctc	gcacccgggag	ccgtaccccg	5400
tcgaagctggg	aaccttccgg	ctcatgtcggt	gacccggctg	cccccggctg	aagaagtgag	5460
gagagccaggt	cgccgaagcc	tgccgaagagt	cgccctgggt	cgccctgggt	gaacacggctt	5520
gggtcaaatga	tgacotgggtg	cattgcacac	gotagggcct	tgtggggctca	gttccgggtg	5580
gggggtcaagc	agccagcgct	ttactggcat	ttcaggaaca	agccggcact	gotcgagcca	5640
cttgcttctgg	tcagtatctgc	tcgggagccca	cgcccgctct	tacgaactgc	cgataaacag	5700
aggattaaaa	ttgacaattg	tgattaaaggg	tcagatttoga	cggtttggag	cgcccgacgt	5760
gcaggattttc	cgcgagatcc	gattgtcggg	cctgaagaaa	gctccagaga	tgttccjgtc	5820
cggtttacag	caagagggaga	aaaagcccat	ggagggcgttc	gctgaacggg	tgccagatgc	5880
cggtggcattc	ggcgcttaca	tcgaacggcca	gatcattggg	ctgtcggtct	tcacacaggga	5940
ggacgggccc	aaggacgcct	acaaggcgcca	tctgtccggc	gttttctgtg	agcccgacaa	6000
gagagggcca	gggtctggcg	gtatgctgct	gggycggttg	ccggcggttt	tatgtctcgt	6060
gatgatctgc	cgacagatct	caacgggaat	ctggtcgatg	cgcatcttca	tctctcgjgc	6120
acctaataatt	tcgctattct	ggagcttggt	gttattttcg	gtctacccgc	tgccggjggg	6180
ggctcgcgxgc	acggtagggc	ctgtgcagcc	gctgatggct	gtgttcatct	ctgcgcgtct	6240
gotaggttagc	ccgatccgat	tgatggcggt	cctggggcct	atttgccgaa	ctgcgggggt	6300
ggcgctgttg	gtgttgacac	caaacgcagc	gotagatcct	gtcccgctcg	cagagggcct	6360
ggcgggggcg	gtttccatgg	cgttcggjaac	cgtgttgacc	cgcaagtggc	aaactccgtt	6420
gcctctgctc	acctttacgg	ccctggcaact	ggcgccggga	ggactctctg	tcgttccagt	6480
agctttagtg	tttgatccgc	caatcccgat	gcctacagga	acaaatgttc	tcjgcctggc	6540
gtggctcgjgc	ctgatccggg	cggggttaac	ctaactccct	tggttcggjg	ggatctggcg	6600
actcgaaacct	acagttgttt	ccttaactgg	ctttctcagc	cjggatgggg	ctaagaagct	6660
atttcggccg	atcttccatc	gcjgtgtgaa	ataccgcaca	gatgcgttaag	gagaaaaatc	6720
cgcctcaggg	gctcttccgc	tcctctcgct	actgacthgc	tgcjctcggt	cgctccggct	6780
cgccgagccg	tatcagctca	ctcaaacggc	gtaatacggg	tatccacaga	atcaggggat	6840
aacgcagggaa	agaacatgtg	agcaaaaagg	cagcaaaaagg	ccagjaaccc	taaaaaaggcc	6900
gcgttgctgg	cgtttttcca	taggcctccg	ccccctgacg	agcatcacaa	aaatcjacgc	6960
tcaggtcaga	gggtggcgaaa	cccgacagga	ctataaagat	accagggcgt	tcocctggga	7020
agctccctcg	tgcgctctcc	tggtctgacc	ctgcocgtta	ccggatccct	gtccgctttt	7080
ctcccttcgg	gaagcgctgg	gctttctcaa	tgctccagct	gtaggtatct	cagttcgggtg	7140
taggtcgttc	gctccaaagt	gggtctgttg	caagaaacccc	ccgttcagcc	cgacccgtcg	7200
gccttatctg	gtaactatcg	tccttgactcc	aacccggtaa	gacacgcact	atcgccactg	7260
gcajccagcca	ctggtaacag	gattagcaga	gagaggtatg	tagccggctg	tacagagttc	7320
ttgaaagtgt	ggcctaacta	cggtacact	agaaagacag	tatttggtat	ctgcgctctg	7380
ctgaagccag	ttaccttcgg	aaaaagagtt	ggtagctctt	gateccggcaa	acaaaacacc	7440
gotggtagcg	gggtttttt	tggttgcaag	cagccagatta	cgccgcagaaa	aaaagjatct	7500
caaggaagatc	ctttgatctt	ttctacjggg	tctjagctcc	agtggaaoca	aaactccagc	7560
taagggatct	tggtcatjag	atttatcaaaa	aggatcttca	cctagatcct	tttaaatcaa	7620
aaatgaagtt	ttaaatcaat	ctaaaagtala	tatjagttaa	cttggtctga	cggttaccaa	7680
tgcttaataca	gugagjcaac	tatctcaggg	atctgtctat	tccttccatc	cataggttgc	7740
tgactccccc	tcgtgtagat	aaactccgata	cgggaggggt	taccatctgg	ccccaaggtc	7800
gcacatgatac	cgcgagjacc	acgtccacgg	gctccagatt	tatccagcaat	aaacccagcca	7860
gcgggaaggg	ccgagcgccg	aagtggctct	gcaactttat	ccjctcccat	ccaggtctatt	7920
aaacaagtg	ccjcaacggg	ttcgcaaac	tgtaacggct	ttgttgccaa	aaagccggcc	7980
aggtttcgga	tcctgtgtgc	caggcggttag	gggttatatg	aaagatttcgg	tgatccctga	8040
gcaggtggcg	gaaaacttgg	atgctcgagaa	ccatttccatt	gttcgtgaag	tggttcgatgt	8100
gcacccatcc	gacccaaggct	ttgaactatc	taccagaagt	gtjagccctt	acgggaaggga	8160
ttacatctctg	gatgatgaact	ctgatgaaia	ctctgcttgc	tatjggccat	tcactgacca	8220
agagcttgctc	gggaagattg	aaactcaactc	aaactggaaac	gatctagcct	ctatccgaaca	8280
cattgttggtg	tcgcacacgc	acccagggcaa	aggagtcggc	ccaggtctca	tcgaatttgc	8340
gaaaaagtg	gcactaaagca	gacagctcct	tgccatacga	ttagagacac	aaaogaacaa	8400
tgtaacctg	tgcaatttgt	acgcacaaatg	tggttttact	ctcgggggca	ttgacotgtt	8460
caagtatataa	actagacctc	aagtctcgaa	cgaaaacagcg	atgtactggg	actgggttctc	8520

10000
10010
10020
10030
10040
10050
10060
10070
10080
10090
10100
10110
10120
10130
10140
10150
10160
10170
10180
10190
10200
10210
10220
10230
10240
10250
10260
10270
10280
10290
10300
10310
10320
10330
10340
10350
10360
10370
10380
10390
10400
10410
10420
10430
10440
10450
10460
10470
10480
10490
10500
10510
10520
10530
10540
10550
10560
10570
10580
10590
10600
10610
10620
10630
10640
10650
10660
10670
10680
10690
10700
10710
10720
10730
10740
10750
10760
10770
10780
10790
10800
10810
10820
10830
10840
10850
10860
10870
10880
10890
10900
10910
10920
10930
10940
10950
10960
10970
10980
10990
11000
11010
11020
11030
11040
11050
11060
11070
11080
11090
11100
11110
11120
11130
11140
11150
11160
11170
11180
11190
11200
11210
11220
11230
11240
11250
11260
11270
11280
11290
11300
11310
11320
11330
11340
11350
11360
11370
11380
11390
11400
11410
11420
11430
11440
11450
11460
11470
11480
11490
11500
11510
11520
11530
11540
11550
11560
11570
11580
11590
11600
11610
11620
11630
11640
11650
11660
11670
11680
11690
11700
11710
11720
11730
11740
11750
11760
11770
11780
11790
11800
11810
11820
11830
11840
11850
11860
11870
11880
11890
11900
11910
11920
11930
11940
11950
11960
11970
11980
11990
12000
12010
12020
12030
12040
12050
12060
12070
12080
12090
12100
12110
12120
12130
12140
12150
12160
12170
12180
12190
12200
12210
12220
12230
12240
12250
12260
12270
12280
12290
12300
12310
12320
12330
12340
12350
12360
12370
12380
12390
12400
12410
12420
12430
12440
12450
12460
12470
12480
12490
12500
12510
12520
12530
12540
12550
12560
12570
12580
12590
12600
12610
12620
12630
12640
12650
12660
12670
12680
12690
12700
12710
12720
12730
12740
12750
12760
12770
12780
12790
12800
12810
12820
12830
12840
12850
12860
12870
12880
12890
12900
12910
12920
12930
12940
12950
12960
12970
12980
12990
13000
13010
13020
13030
13040
13050
13060
13070
13080
13090
13100
13110
13120
13130
13140
13150
13160
13170
13180
13190
13200
13210
13220
13230
13240
13250
13260
13270
13280
13290
13300
13310
13320
13330
13340
13350
13360
13370
13380
13390
13400
13410
13420
13430
13440
13450
13460
13470
13480
13490
13500
13510
13520
13530
13540
13550
13560
13570
13580
13590
13600
13610
13620
13630
13640
13650
13660
13670
13680
13690
13700
13710
13720
13730
13740
13750
13760
13770
13780
13790
13800
13810
13820
13830
13840
13850
13860
13870
13880
13890
13900
13910
13920
13930
13940
13950
13960
13970
13980
13990
14000
14010
14020
14030
14040
14050
14060
14070
14080
14090
14100
14110
14120
14130
14140
14150
14160
14170
14180
14190
14200
14210
14220
14230
14240
14250
14260
14270
14280
14290
14300
14310
14320
14330
14340
14350
14360
14370
14380
14390
14400
14410
14420
14430
14440
14450
14460
14470
14480
14490
14500
14510
14520
14530
14540
14550
14560
14570
14580
14590
14600
14610
14620
14630
14640
14650
14660
14670
14680
14690
14700
14710
14720
14730
14740
14750
14760
14770
14780
14790
14800
14810
14820
14830
14840
14850
14860
14870
14880
14890
14900
14910
14920
14930
14940
14950
14960
14970
14980
14990
15000
15010
15020
15030
15040
15050
15060
15070
15080
15090
15100
15110
15120
15130
15140
15150
15160
15170
15180
15190
15200
15210
15220
15230
15240
15250
15260
15270
15280
15290
15300
15310
15320
15330
15340
15350
15360
15370
15380
15390
15400
15410
15420
15430
15440
15450
15460
15470
15480
15490
15500
15510
15520
15530
15540
15550
15560
15570
15580
15590
15600
15610
15620
15630
15640
15650
15660
15670
15680
15690
15700
15710
15720
15730
15740
15750
15760
15770
15780
15790
15800
15810
15820
15830
15840

aggttaggtt	tttcaatttt	agaaagaatg	ctgacccaca	gatgggtaga	gaggccctacg	12240
agccaggttt	tttcaagag	atctacccga	gttaacaaat	ccaggagato	aaatacctt	12300
ccaggaaagt	taaaagatga	gtcaaaaagat	tcaggagctaa	ttgcatcaag	aaacacagaga	12360
agagacatatt	tttcaagatg	agaaagtaata	ttccagctatg	gacgatttcaa	ggcttggctt	12420
ataaaacaa	gtcaagtaata	gagattggag	ttcttaaaaa	ggtagtttctt	actgaatctt	12480
agcccatgca	ttggattctaa	gatttcaaat	gaggtatctaa	cagaactctg	cgtgaagact	12540
ggcgaaacagt	ttatcacagag	tttttttaaga	ctcaatgaca	agaaagaaat	cttctgcaac	12600
atgggtggag	agacacactct	ggtctactct	aaaaatgtca	agatatacagt	ctcagaagac	12660
caaaagggtta	ttgagaccttt	ttcaacaaaag	ataattttgg	gaaaactctct	cggtattctat	12720
tgccacagcta	ttgtgtcaatt	catcgaaaag	acagtagaaaa	aggaagggtg	ctctctacaaa	12780
tgccatcatt	ggcataaaag	aaaggcttct	attcaagatc	ttctgtcgga	cagtgggtccc	12840
aaagatggag	ccccacccac	gaggagcctc	gtggaaaaag	aagaactctc	aaacacgtct	12900
tcaaaagcaat	ttggattgatg	tgacatctct	actgaactga	gggatgacgc	acaatcccac	12960
tatctctctg	aagacccctt	ctctatataa	ggaagtctct	ttcatttggg	gaggacacgc	13020
tcgagacaa	tttgtacaaa	aaagctgaa	gagaaacgtt	aaatgatata	aatatcaata	13080
tattaaatta	gatttttgc	aaaaaacaga	ctacataata	ctgtaaaaaa	caacatctct	13140
agtcactatg	aatcaactac	ttgatgggtt	ttagtgaact	gtagtgcac	gacagcctt	13200
caaatgttct	tcgggtgatg	ctgcccactt	actgcacga	cagcctctca	aatgtttctt	13260
tcaaaacggaa	tcgtctgtat	cagcctactc	gtattgtct	tcaatgcctg	attaaatcat	13320
aaaaagaatt	aagaaaaaga	ggtgcgagac	ttttttttgt	gtgacaaaat	aaaaacatct	13380
acctattctat	atacctagat	gtcatagtct	tgaaaatcat	ctgcacaaag	aaacatttca	13440
caactcttat	acttttctct	tacaagtctg	tcggcttcat	ctggattttc	agctctctata	13500
cttactaaac	gtgataaagt	ttctgtaat	ttctactgtat	cgacctgcag	actggctgtg	13560
tataagggag	cttgacattt	atattcccca	gaacatcagg	ttaatggcgt	ttttgatgtc	13620
atttttcggg	tggttgacat	cagccacttc	ttccccgata	acggagacgg	gcacactggc	13680
catatcgggtg	gtcatcatgc	gccagcttct	atccccgata	tgacccacgg	ggtaaagtct	13740
acggggagact	ttatctgaca	gcagacgtgc	actggccagg	gggtacacca	tcctgtcgcc	13800
gggcgtgtca	ataatatcac	totgtacatc	cacaaacaga	cgataacggc	ttctctctttt	13860
ataggtgttaa	accttaaaat	gcatttccac	agtccctgtt	ctcgtcagca	aaagagccgt	13920
tcattttcaat	aaacccgggg	acctcagcca	ttcccttctg	atcttccgtt	ttccagcgtt	13980
cggcacgcag	acgaacgggt	tcattctgca	tggttctgtc	taccagacgg	gagatattga	14040
catcatatat	gcctttagca	actgatagct	gtcgtctgtc	actgtcaact	taatacgtgt	14100
cttcatagca	cacctctttt	tgacatactt	cgggttagtg	cgatcaacgt	ctcatttttg	14160
ccaaaaagt	gcccagggtt	tcctgggtat	aacagggaca	ccaggattta	tttattctgc	14220
gaagtgaact	tcctgtcacg	gtattttatc	ggcgcaaaat	gcgttcgggtg	atgtgtccaa	14280
cttagtgcag	tacaggtcac	taataccatc	taagttagtg	attcatagtg	actggatatg	14340
ttgtgtttta	cagtattatg	tagtctgttt	tttatgcaaa	atctaattta	atatattgat	14400
atttatataca	ttttacgttt	ctcgttcagc	tttcttgtac	aaagtctgtc	cgaggaattc	14460
ggtacccacg	cttggtaagg	aaataattat	tttctttttt	cttttttagta	taaaatagtt	14520
aagtgatgtt	aattagtatg	attataataa	tatagttgtt	ataattgtga	aaaaataatt	14580
tataaatata	ttgtttacat	aaacaacata	gtaatgtaaa	aaaatatgac	aagtgatgtg	14640
taagacgaag	aagataaaa	ttgagagtaa	gtatatattt	tttaatgaat	ttgatcgaa	14700
atgtaagatg	atatactagc	attaatattt	gttttaatca	taatagtaat	tttagctggt	14760
ttgatgaatt	aaatatcaat	gataaaaatc	tacagtataa	ataagaataa	ataaattaaa	14820
ataaatatttt	tttatgatta	atagtttatt	atataattaa	atatctatac	cattactaaa	14880
tattttagtt	taaaagttaa	taaatatttt	gttagaaaat	ccaatctggt	tgtaatttat	14940
caataaacaa	aatattaaat	aaacagctaa	agtaacaaat	aatatcaaac	taatagaaac	15000
agtaattctaa	tgtaacaaaa	cataatctaa	tgtaaatata	acaaagcgca	agatctatca	15060
ttttatatag	tattattttc	aatcaacatt	cttattaatt	tttaaatatt	acttgtagtt	15120
ttattaactt	ctaaatggat	tgactattaa	ttaaatgaat	tagtcgaaca	tgaataaaca	15180
aggtaacatg	atagatcatg	tcatttggtt	atcattgata	ttacatttgg	attgattaca	15240
gttgggaagc	tggtttcgaa	atcgataagc	ttggatctct	tagaccactt	tgtacaagaa	15300
agotgaaaga	gaaaacgtaaa	atgatataaa	tatcaatata	ttaaattaga	ttttgcataa	15360
aaaaacagact	acataatact	gtaaaaacaa	acatatccag	tcactatgaa	tcaactactt	15420
agatgggtatt	agtgaactgt	agtcgaactaa	gttggcagca	tcacccgagg	cacttttggc	15480
cgataaaata	ctgttgacgg	aaagatcaatt	cgcagaataa	ataaatctctg	gtgtccctgt	15540
tgataacggg	aagccctggg	ccaaactttt	gggaaaaatga	gaegttagtc	ggattttcaca	15600
actcttatac	ttttctcttta	caagtctgtc	ggcttctatc	ggattttcag	ctctctatact	15660
tactaaaagt	gataaaagttt	ctgttaatttc	taactgtatg	acctgcagac	tggtgtgtgt	15720
taagggagcc	tgacatttat	attccccaga	acatcaggtt	aatggcggtt	ttgatgtcat	15780
tttcgggttg	gtcgagatca	gccaattctt	ccccgataac	ggagacccgc	acaactggcca	15840

tatgggtggt	cataatgggc	caggttttcat	cccgatattg	caccacccggg	taaaagttcac	15900
gggagacgtt	atctgacagg	agaggtgcat	tggtcagggg	gacacccatc	cgctgcgggg	15960
gggtgtcaat	aatacaatc	tgatcatcca	caaacagagc	ataacgggtc	tctctttttat	16020
aggtgtcaaa	cttaaaatgc	atttcaaccg	tctctgttct	cgtraggaaa	agagccggttc	16080
atttcaataa	acgggggagc	ctcagccatc	cttctctgat	tttccggttc	ccagcggttcg	16140
ggaagagagc	gacggggttc	attctgcatt	gttgtgttta	ccagacccga	gatatcgaca	16200
tcataatgac	cttgagagac	tgatagctgt	cgctgtcaac	tgtaactgta	ataagctgct	16260
tcataagaca	ctcttttttg	acataactct	gttcttgatg	cagatgattt	tcaggactat	16320
gacactagcg	tatatgaata	ggtagatgtt	tttattttgt	caacacaaaa	agagggtcgc	16380
actctttttt	cttattctct	tttatgattt	aatacggcat	tgaggacaa	agcgagtagg	16440
ctggatacga	cgattccgtt	tgagaagaa	atttgggaag	ctgtcggtcg	actaaagttg	16500
cagcatcacc	cgaagaacat	ttggaaggct	gtcggtcgac	taacaggtc	taataccatc	16560
taagtaggtg	attcatagtg	actggatatt	ttgtgtttta	cagtattatg	tagtctgttt	16620
tttatccaaa	attcaattta	atatattgat	atttatatca	ttttaagttt	ctcggtccagc	16680
ttttttgtac	aaacttgtct	agagtctctg	tttaatgaga	tatgcgagac	gcctatgato	16740
gcattgtatt	tgctttcaat	tctgttgtgc	acgttgtaaa	aaacctgagc	atgtgttagct	16800
cagatcttta	cggccgggtt	cggttctatt	taatgaatat	atcaccggtt	actatcggtat	16860
ttttatgaat	aatattctcc	gttcaattta	ctgattgtac	cctactactt	atatgtacaa	16920
tatttanaatg	aaaaacaatat	attgttctga	atagggtttat	agcgacatct	atgatagagc	16980
gccacacataa	caaaaatattg	cgttttatta	ttacaaatcc	aattttaaaa	aaagcggcag	17040
aaacgggtcaa	acctaaaaga	ctgattacat	aaatcttatt	caaatttcaa	aaggccccag	17100
gggttagtat	ctacgacaca	cggagcggcg	aactaataac	gttcaactgaa	gggaartccg	17160
gttcccgccc	ggcgcgcatg	ggtgagattc	cttgaaagtg	agtattggcc	gtccgtctta	17220
ccgaaagtta	cgggcacat	tcaatccggt	ccagcccgcc	ggccgggttaa	cgaatttgt	17280
gcgcgagaaa	ttatgagaca	tttttttgtt	gtatgtgggc	cccaaatgaa	gtgcaggtca	17340
aaacttgaca	gtgacgacaa	atcgttgggc	gggtccaggg	cgaattttgc	gacacatgt	17400
cagggctcag	caggacctgc	agggatgcaa	gctaggttac	tagtgatgca	tattctatag	17460
tgtracataa	atctgc					17470

<110> 25
 <111> 17458
 <112> DNA
 <113> Artificial sequence

<121>
 <122> acceptor vector pHELLSGATE11

<400> 25						60
ggcgcaacta	gtcatatccc	ggggccatgg	eggcggggag	catgcgacgt	cgggcccaat	120
tcggcctata	gtgagtcgta	ttacaattca	ctggccgtcg	ttttacaacg	togtgactgg	180
gaaaacccgtg	gcgttaccca	aactaatcgc	cttgagagac	atcccccttt	cgcagctggg	240
cgtaatatgag	aagagggccg	cacggatcgc	ccttcacaac	agttggcgag	cctgaatggc	300
gaatggaaat	tgtaaaaggtt	aatgggtttc	tggaatttaa	tgaggttaagc	acatacgtca	360
gaacccatta	ttggcggttc	aaaagtgcgc	taaggtcaact	atcagctagc	aaatatttct	420
tgtcaaaaat	gctccactga	cgttccataa	attccctctg	gtatccaatt	agagtctcat	480
attcaactctc	aatccasata	atctgcaatg	gcaattacct	tatccgcaac	ttctttacct	540
atttccggccc	ggatccgggc	aggttctccg	gccgcttggg	tgagagggct	attccgctat	600
gactggggcac	aacagacaa	cggctgctct	gatgccgcgc	tgttccggct	gtcagcgcag	660
ggcgcccgcg	ttctttttgt	caagaccgac	ctgtccgggt	ccctgaatga	actgcaggac	720
gagggcagcgc	ggetatcgtg	gctggccacg	acgggcgttc	cttcgcgcgc	tgtgtctgac	780
gttgtcaactg	aagcgggaag	ggactgggtg	ctattggggc	aagtgcgcgg	gcaggatctc	840
ctgtcatctc	accttgctcc	tgccgagaaa	gtatccatca	tgctgatgc	aatgcggcgg	900
ctgcatacgc	ttgatccggc	taactgcaca	ttcgaccacc	aagcgaaaaca	tgcacatcag	960
cggcgaacgta	ctcggatgga	agccggctct	gtcpatcagg	atgatctgga	cgaagagcat	1020
caugggctcgc	cgcacagccga	actgttcgcgc	aggtccaagg	cgcgcacgac	cgaaggcgag	1080
gatctcgtcg	tgacccatgg	cgatgcctgc	ttgcogaata	tcattggtgga	aaatggcgc	1140
ttttctggat	tcatacactg	tgcccggtcg	ggtctggcgg	accgctatca	ggacatagcg	1200
ttggctacccc	gtgatattgc	tgaagagctt	ggcggcgaa	gggtgacgc	cttctctgtg	1260
ctttacggta	tgcgcgtctc	cgtatccgac	cgcctcgcct	tctatcgcct	tcttgacgag	1320
ttctctctgag	cgggaactctg	gggttcgaaa	tgacgcacca	agcgacgcgc	aaactgcacat	1380

baagagat	ggattccacc	ggggccttct	atgaaaggt	gggcttggga	atggttttcc	1380
ggagagggg	gggatggat	ctccagggcg	gggatctcat	ggggaggtt	ttggcccaac	1440
ggatccaa	atttaaggtt	gaaaggtcca	agagcaata	gacacagaa	gggggaaggt	1500
ggggagag	tggtgatttc	gtctcaatto	ttctttgag	gaatgcaatg	atgaatatga	1560
taactgact	gaaactttga	gggaatactg	cttagacacg	tcacctcata	aggtgcatca	1620
tgcatgcccc	gacaaacatg	aacatcgcta	ttttctggaa	gaattatgct	cgttggaggga	1680
tgctggggga	attgacagta	ttggcaaacat	cgaaactacc	ctcagcagtg	cattcatcaa	1740
tattattcat	ggggggaaaa	gcaagattaa	tcacactggc	aaatcatcca	gggtgattgg	1800
taaattcagt	cccgagagac	tgattcggtt	tggtgtaccc	caagttttca	ataaggagca	1860
gattgtggag	taaaagaagg	gtggtcgaaa	ggagatcggt	caaacatttg	gcaataaagt	1920
ttcttaagat	tgaatcctgt	tgccgggtct	gggatgatta	tcataataat	ttgtttgaat	1980
taagtttaag	atgtaataat	taacatgtaa	tgcatgacgt	tatttatgag	atgggttttt	2040
atgattagag	tcggccaatt	atacatttaa	taactgatat	aaaaacaaat	ataggcgcca	2100
aaactaggata	aattatcgcg	cggggtgtca	ttatgtttac	tagatcgaat	taattccagg	2160
cggtgaaggg	caatcagctg	ttggcccgct	caactgtgaa	aagaaaaacc	acccagtgac	2220
attaaaaaac	tcggcaatgt	gttatttaagt	tgtctaaagg	tcnaatttgtt	tacacacaaa	2280
tatatccctg	caccagccag	ccaacagctc	cccgagccgc	agctcgccac	aaaaacacca	2340
ctcgatacag	gcagcccatc	agtcggggac	gpcjtcagcg	ggagagccgt	tgtaaggcgg	2400
cagaactttg	tcattgttaac	gatgtctatc	gaaagacgg	caactaagct	gggggtttg	2460
aaacacggat	gatttcggcg	agggtagcat	gttjattgta	angatgacag	agcggttgctg	2520
ccctgtgatca	aattatcatc	ccctcgccga	gatctgaatt	atcagccttc	ttattcattt	2580
ctcgcttaac	cgtagacagg	tgtcgatctt	gagaactatg	cgacataat	aggaaatcgc	2640
tggtataaag	cgctgaggaa	gctgagtggc	ggtattcttt	tagaagtga	cgttgacgat	2700
gtcgacggat	cttttccggt	gcataaccc	gcttcgggg	cattatagcg	attttttcgg	2760
tatatccatc	ctttttcggc	cgatatacag	gattttgcca	aagggttgt	gtagactttc	2820
cttggtgcat	ccaacggcgt	cagccgggca	ggatagggtg	agtaaggcca	cccgagagcg	2880
gggtgtcttt	cttccactgc	ccctattcgc	acctgggggt	gttcaacggg	aatccctgct	2940
tgcgaggggt	ggcggtaccc	ggcgcgta	cagatgaggg	caaggggatg	gctgatgaaa	3000
ccaagcccaac	cagggggtgat	gctgccaact	taactgattta	gtgtatgatg	gtgtttttga	3060
ggtgtctccag	tggtctctgt	ttctatccag	tgccctccct	gttcagctac	tgacgggggtg	3120
gtcggttaac	gcaaaaagcac	cgccggacat	cagcgctatc	tttgcctcca	ctgpcgtaaa	3180
acatggcaac	tgcagttcac	ttacacccgt	ttccaccccg	gtacgcacca	gaaaatcatt	3240
gatattggcca	tgaatggcgt	tggtatgcgg	gcaacagccc	gcattatggg	cgttggccctc	3300
aacacgattt	tacgtcactt	aaaaaactca	ggccctcagtc	ggtaacctcg	cgcatacagc	3360
cgggcagtg	cgctcatctc	tgccgggaaa	tggaagcaaa	gtggggctat	gtcggggcta	3420
aatcggccca	gcctggctg	ttttacgggt	atjacagctc	ccgggaagag	gtgtttgccc	3480
acgtatttgg	tgaaagccact	atggcgacgc	tgaggcgtct	tatpagccctg	ctgtcaacct	3540
ttgacgttgt	gatattgpatg	acggatggct	ggccgctgta	tgastccccc	ctgaaggggaa	3600
agctgacagt	aatcagcaag	cgatatacgc	agcgaattga	ggggcataac	ctgaactctga	3660
ggtagcactc	ggcaaggctg	ggacgggaat	cgctgtcgtt	ctcaaaaatcg	gtggagctgc	3720
atpacaagpt	catcgggcat	tatttgaaac	taaaacacta	tcnaataagtt	ggagtcatta	3780
cccaacccagg	aagggcagcc	caactatcaa	ggtgtantgc	cttccagacg	aacgaagagc	3840
jatttgaggaa	aaggggggg	cgccggccat	gaggtgtctg	ccctacctgc	tgcccgccgg	3900
ccaggggtcac	aaaaaccagg	ggctcgttga	ctatgagcac	gtccggcagc	tgccccgcat	3960
caatggcgac	ctggggccgc	tgggcggtct	gctgaaactc	tggtccaccc	acgaaccccg	4020
caaggcgagg	ttcggtgatg	ccacgatcc	cgccctgtg	gggaagatcg	aagaagagca	4080
ggagagagct	ggcaagggtca	tgatggggct	ggctccggcg	aggycagagc	catgactttt	4140
ttagccgcta	aaaacggccg	gggtgagcg	tgattgcaaa	gcacgttccc	atgggtccca	4200
tcaggaagag	cgacttcggc	gagctggtat	tcgtgcaggg	caagattcgg	aataccaaagt	4260
acgagaaggga	cggcacagac	gtctacggga	ccgaattcat	tgccgataag	gtggatttano	4320
tggaataccaa	ggcaccagcc	gggtcaaaatc	aggaataagg	gcacattgcc	ccggcgtgag	4380
tcgggggaat	cccgcaaggga	gggtgaatga	atcggaagctt	tgacccggaag	gcatacaggc	4440
aagaaactgat	cgacgcgggg	ttttccggcg	agpatgcgca	aactatcgca	agccgcacccg	4500
tcactccctgc	ggcccgccgaa	actttccagt	ccgtccggctc	gatggtcacg	caagctacgg	4560
ccaagatcga	ggcgacacag	gttcaactgg	ctccccctgc	ccctgcccgcg	ccatccggccg	4620
ccgtggagcg	ttccgctcgt	cttggaacagg	agggggaggg	tttggcggaag	tcgatgacca	4680
tcgacacggcg	aggaaactatg	acgaccaaga	agcgaaaaaac	cgccggcgag	gacotggcaa	4740
aacaggtcag	cgaggccaag	caggcccgct	tgctgaaaca	caaggaagcag	cagatcaagg	4800
aaatgcagct	ttccttggtc	gataattggcg	cggtggccgga	caagatgcga	gggatgccaa	4860
acgacacggc	ccgtctcgcc	ctgttccacca	cgcgcaacaaa	gaaaaatcccg	cgcgaggcgcc	4920
tgcaaaaacaa	ggctcattttc	caagtcacaca	aggacgtgaa	gataccctac	acccggtctg	4980

agctggggg	ggagagatgac	gaaactgggtgt	ggagagaggt	gttggagtag	ggagagagca	8040
cccttatcgg	ggagagagatc	accttcaaggt	tctacagaggt	ttggcagggac	ctgggttaggt	8100
ggatcaatgg	ccgggtattaa	aggaaggccg	aggaatggcct	gtcgagccta	caggagaggg	8160
ggatgggctt	caagttccgac	gggttgggg	acctgggaatc	ggtgtcgctg	ctggacccggt	8220
tccggttctt	ggacccgttgg	aagaaaaagt	ccgtttgcca	ggtcccgatc	gaagaggaaa	8280
tgttcgttgc	gacccactaca	gacccactaca	cgaaattccat	atggggagaa	tacggcaagc	8340
tgttcgttgc	atgttcgaact	atgttcgaact	atcttcagctc	gcacccggag	cgtaaccggc	8400
tgttcgttgc	gtcccgagcgg	gtcccgagcgg	gatccggatc	cccccgggtg	aagaaagtggc	8460
tcaaggtgga	aacctttccgc	gtcccgagcgg	tgcgaggcag	cgccctgggtg	gaacacggct	8520
ggagagaggt	gggggaaaggc	tgcgaggcag	tgcgaggcag	ggccctgggtg	gttcgggtcg	8580
gggtcaatga	tgacccgttgg	catcgaaaa	gctaggggcct	tggtgggtcga	gctcgacggc	8640
gggtttcagc	agccagcgct	ttactggcat	ctcagggaaca	agggggcaact	cgataaaacag	8700
cttgcttcgc	tcagtatcgc	tggggaacgca	cgggcgcgctc	tacgaactgc	cgcccgacgt	8760
aggattaaaa	ttgacaattg	tgattaaaggc	tcagatttoga	cggtttggag	tggttcgggtc	8820
gcaggatttc	cgcgagatcc	gattgttcggc	cctgaagaaa	gctccagaga	tgcgagatgc	8880
cgtttaacgag	caacgaggaga	aaaaagcccat	ggaggcgcttc	gctgaacggc	tgccagagatc	8940
cgtggccatc	ggccgcctaca	tcgacggcgca	gatcattggg	ctgttcggctc	tcaaaacagga	9000
ggacggccccc	aaggacgcctc	acaaggcgca	tcgttcgggc	gttttcgttg	agcccgaaaca	9060
ggagagggcga	gggttcggcg	gtatgttgc	ggggcggttg	ccggcggttc	tatttcctgt	9120
gatgatcgtc	cgacagattc	caacggggaat	ctggtggatg	cgcatttcca	tcctcgggcg	9180
acttaatat	tgggtattct	ggagcttctt	gtttatttgc	gtctacggcc	tgccggggcg	9240
gggttcggcg	aggttagggc	ctgttcggcg	gctgatggctc	gtgttcctct	ctgcggctct	9300
gctaggttagc	ccgatacgat	tgatggcgct	cctgggggct	atttgcgga	ctgcggcgct	9360
ggcgctgttg	gtgttgacac	caaaacccagc	gctagatcct	gtcgggcgctg	cagcgggcct	9420
ggcgggggcg	gtttccatgg	cgtttcggaa	cgtgttgacc	cgcaagtggc	aaactccgt	9480
gcctctgctc	acctttaccc	cctgggaact	ggcgccggga	ggaacttcgc	tcgttcacgt	9540
agcttttagtg	tttgatccgc	caatctcgat	gcttacagga	accaatgttc	tcggcctggc	9600
gtggttcggc	ctgatccggg	cggttttaac	ctacttcctt	tggttcggcg	ggatctcgcg	9660
actcgaaact	acagttgttt	ccttactggg	ctttctcagc	cgggatggcg	ctaagaaact	9720
attgcggcg	atcttcctat	gggttgtaa	atccgcgaca	gatgcgtaa	gagaaaaaac	9780
cgatccaggc	gctcttcggc	ttcttcgctc	actgactcgc	tgcgctcggt	cgttcgggtg	9840
cgcgagcgcg	tatcagctca	ctcacaaggcg	gtaatacggc	tatccacaga	atcaggggat	9900
aaacgagga	agaacatgtg	agcaaaaggc	cagcaaaagg	ccaggaaacg	aaatcgagc	9960
gggttcctcg	cgtttttcca	taggctccgc	cccttcgacg	agcatcaaaa	aaatcgagc	7020
tcaagtcaag	gggtggcgaaa	cccgatagga	ctataaagat	accagggttt	tcctccggga	7080
agctccctcg	tgccgtctcc	tggttcggac	ctgttcgctta	ccggatagct	gtccggcttt	7140
ctcccttcgg	gaagcgctgc	gctttcccaa	tgcttcagct	gtaggtatct	cagttcggtg	7200
taggtcgctt	gctccaaact	gggttcgctg	caagaaaccc	ccgttcagcc	cgacccgtgc	7260
gccttatccg	gtaaactatc	tcttcagctc	aaacgggtta	gacacgactt	atcgccactg	7320
gcagcagcca	ctggtaacag	gatttagcga	gcgaggtatg	tagggcggtc	tacagagttc	7380
ttgaagtggt	ggcctaaact	cggctacact	agaaggacag	tatttggat	ctgcgctcg	7440
ctgaagccag	ttaccttcgg	aaaaagagtt	ggtagctctt	gctccggcaa	acaaaaccac	7500
gctggttagc	gtggtttttt	tggttcgaa	cagcajatta	cgcccgagaa	aaaaggatat	7560
caagaagatc	ctttgatctt	ttctacggcg	tttgacgcctc	agtggaaaga	aaactcagct	7620
taagggtatt	tggttcagct	attatcaaaa	aggatcttca	cctagatcct	tttaaatcaa	7680
aaatgaagtt	ttaaatcaat	ctaaagtata	tatgagtaaa	cttggtctga	cagttaccaa	7740
tgtttaatna	gtgaggcacc	tatctcagcg	atctgtctat	ttcgttcctc	catagttcgc	7800
tjaactcccg	tcgtgtagat	aaactcagata	ggggagggct	tacccatctg	cccgaggtct	7860
gpaatgatcc	cgcgagaccc	acgtccaccc	gctccagatt	tatcagcaat	aaacagcga	7920
gpcggagagg	ccgagcgccg	aaagtgcctt	gcaactttat	ccgctccat	ccagttctat	7980
aaacaaagtg	cagcaacggga	ttcgcaaac	tgctcagcct	ttgttgccaa	aagccggcg	8040
aggttttgcg	tcgctgtgc	caggcggttag	cgctcatatg	aagatttcgg	tgatccctga	8100
gcaggtggcg	gaaacattgg	atgtcgagaa	ccatttcatt	gttcgtgaag	tggttcgatgt	8160
gcacctatcc	gacaaaggct	ttgaaactat	tacagaaggt	gtgagccctt	accgggaagga	8220
ttacatctcg	gatgatgaat	ctgatgaaga	ctctgcttgc	tatggcgcat	tcctcgacca	8280
agagcttctc	gggaagattg	aaactcaact	aaactggaac	gatctagcct	ctatcgacca	8340
cattgttctg	tcgcacacgc	accgaggcaa	aggagtcggc	ccagctctca	tcgaacttcg	8400
gaaaaagtgg	gcactaagca	gacagctcct	tgccatacga	ttagagacac	aaaagaaaca	8460
tgtaactgco	tgcaatttct	agcaaaaagt	tggttttaac	ctcgggcgca	ttgacctgtt	8520
caagtataaa	actagaccta	aaagtctcgaa	cgaaaacagc	atgtaactgt	actgggttctc	8580
gggagacag	gatgaacgct	aaacattccat	tcagcccgac	accgcttcgc	ggcggggctt	8640
aattcaggag	ttaaacatca	tgaggggaagc	ggtgatcgcc	gaagtatcga	ctcaactatc	

10000
10010
10020
10030
10040
10050
10060
10070
10080
10090
10100
10110
10120
10130
10140
10150
10160
10170
10180
10190
10200
10210
10220
10230
10240
10250
10260
10270
10280
10290
10300
10310
10320
10330
10340
10350
10360
10370
10380
10390
10400
10410
10420
10430
10440
10450
10460
10470
10480
10490
10500
10510
10520
10530
10540
10550
10560
10570
10580
10590
10600
10610
10620
10630
10640
10650
10660
10670
10680
10690
10700
10710
10720
10730
10740
10750
10760
10770
10780
10790
10800
10810
10820
10830
10840
10850
10860
10870
10880
10890
10900
10910
10920
10930
10940
10950
10960
10970
10980
10990
11000
11010
11020
11030
11040
11050
11060
11070
11080
11090
11100
11110
11120
11130
11140
11150
11160
11170
11180
11190
11200
11210
11220
11230
11240
11250
11260
11270
11280
11290
11300
11310
11320
11330
11340
11350
11360
11370
11380
11390
11400
11410
11420
11430
11440
11450
11460
11470
11480
11490
11500
11510
11520
11530
11540
11550
11560
11570
11580
11590
11600
11610
11620
11630
11640
11650
11660
11670
11680
11690
11700
11710
11720
11730
11740
11750
11760
11770
11780
11790
11800
11810
11820
11830
11840
11850
11860
11870
11880
11890
11900
11910
11920
11930
11940
11950
11960
11970
11980
11990
12000
12010
12020
12030
12040
12050
12060
12070
12080
12090
12100
12110
12120
12130
12140
12150
12160
12170
12180
12190
12200
12210
12220
12230
12240
12250
12260
12270
12280
12290
12300
12310
12320
12330
12340
12350
12360
12370
12380
12390
12400
12410
12420
12430
12440
12450
12460
12470
12480
12490
12500
12510
12520
12530
12540
12550
12560
12570
12580
12590
12600
12610
12620
12630
12640
12650
12660
12670
12680
12690
12700
12710
12720
12730
12740
12750
12760
12770
12780
12790
12800
12810
12820
12830
12840
12850
12860
12870
12880
12890
12900
12910
12920
12930
12940
12950
12960
12970
12980
12990
13000
13010
13020
13030
13040
13050
13060
13070
13080
13090
13100
13110
13120
13130
13140
13150
13160
13170
13180
13190
13200
13210
13220
13230
13240
13250
13260
13270
13280
13290
13300
13310
13320
13330
13340
13350
13360
13370
13380
13390
13400
13410
13420
13430
13440
13450
13460
13470
13480
13490
13500
13510
13520
13530
13540
13550
13560
13570
13580
13590
13600
13610
13620
13630
13640
13650
13660
13670
13680
13690
13700
13710
13720
13730
13740
13750
13760
13770
13780
13790
13800
13810
13820
13830
13840
13850
13860
13870
13880
13890
13900
13910
13920
13930
13940
13950
13960
13970
13980
13990
14000
14010
14020
14030
14040
14050
14060
14070
14080
14090
14100
14110
14120
14130
14140
14150
14160
14170
14180
14190
14200
14210
14220
14230
14240
14250
14260
14270
14280
14290
14300
14310
14320
14330
14340
14350
14360
14370
14380
14390
14400
14410
14420
14430
14440
14450
14460
14470
14480
14490
14500
14510
14520
14530
14540
14550
14560
14570
14580
14590
14600
14610
14620
14630
14640
14650
14660
14670
14680
14690
14700
14710
14720
14730
14740
14750
14760
14770
14780
14790
14800
14810
14820
14830
14840
14850
14860
14870
14880
14890
14900
14910
14920
14930
14940
14950
14960
14970
14980
14990
15000
15010
15020
15030
15040
15050
15060
15070
15080
15090
15100
15110
15120
15130
15140
15150
15160
15170
15180
15190
15200
15210
15220
15230
15240
15250
15260
15270
15280
15290
15300
15310
15320
15330
15340
15350
15360
15370
15380
15390
15400
15410
15420
15430
15440
15450
15460
15470
15480
15490
15500
15510
15520
15530
15540
15550
15560
15570
15580
15590
15600
15610
15620
15630
15640
15650
15660
15670
15680
15690
15700
15710
15720
15730
15740
15750
15760
15770
15780
15790
15800
15810
15820
15830
15840

ccaaagaaagt	taaaagatgca	gtcaaaaagat	tcagggaactaa	ttgcatcaag	aaacacagaga	12360
aagacatatt	tctcaagatc	agaagttaata	ttccagttatg	gaagattcaaa	ggcttggcttc	12420
ataaaacaaag	gaaagtaata	gagattggag	tctctaaaaa	ggtagttctt	actgaattcga	12480
aggccatgca	tggagttcaaa	gattcaaatc	gaggatctaa	cagaactcgc	cgtgaaagatt	12540
gggaaacagt	tcataacagag	tcttttaaga	ctcaatgaca	agaagaaaaat	cttctgtcaac	12600
atgggtggagc	acgacactct	ggtctactcc	aaaaatgtca	aagataacagt	ctcagaagagc	12660
caaaagggcta	ttgagaacttt	tcaacaaaagg	ataattctgg	gaaactctct	cggattcccat	12720
tgccacagcta	tctgtcaactt	cattcgaaaag	acagttagaaa	aggaaggtgg	ctcctacaaa	12780
tgccatcaatt	gogataaaagg	aaagggtctac	attcaagatc	tctctggcga	cagtggttccc	12840
aaagatggagc	ccccacccac	gaggagcctc	gtggaaaaaag	aagacgttcc	aaaccaagtct	12900
tcaaaagcaag	tggatttgatg	tgacatctctc	actgaagtaa	gggatgacgc	acaatccccc	12960
tatcctctgcg	aagaccccttc	ctctatatata	ggaagttcat	ttcattttgga	gaggacacgc	13020
togagacaag	tttgtacaaa	aaagctgaac	gagaaaaagta	aaatgatata	aatatcaata	13080
tattaaatna	gatttttgcac	aaaaaacaga	ctacataata	ctgtaaaaaca	caacatatccc	13140
agtcactatg	aatcaaacctac	ttagatggta	ttagtgacct	gtagtgcacc	gacagccttc	13200
caaatgtttct	togggtgatg	ctgcccactt	agtcgaacga	cagcctctca	aatgtttcttc	13260
tcaaacgggaa	togtctgtatc	cagcctactc	gttattgtcc	tcaatgcctt	attaaatcat	13320
aaaaagaaat	aagaaaaaga	ggtgcgagcc	tcttttttgt	gtgacaaaaat	aaaaacatct	13380
acctattctat	atacgtctagt	gtcatagtcc	tgaaaatcat	ctgcactcaag	aaacaatttca	13440
caactcttat	actttctctct	tacaagtcgt	tggcttctcat	ctggattttc	agcctctata	13500
cttacttaaac	gtgataaagt	ttctgttaatt	tctactgtat	cgaactgcag	actggctgtg	13560
tataagggag	cctgacattt	atattcccca	gaacatcagg	ttaatggcgt	ttttgatgtc	13620
atttttcgagg	tggctgagat	cagccacttc	ttccccgata	acggagacgc	gcacactggc	13680
catatcgggtg	gtcatcctgc	gccagcttcc	atccccgata	tgcaccaacc	ggtaaaagttc	13740
aogggagact	ttatctgaca	gcagaagtcg	actggccagg	gggatcacca	tccgtgcacc	13800
gggogtgtca	ataatatcac	tctgtacatc	caaaaaacaga	cgataaaggc	tctctctttt	13860
ataggtgtaa	accttaaaact	gcatttcaac	agtcctctgt	ctgttcagca	aaagagccgt	13920
tcattttcaat	aaaccggggc	acctcagcca	tcccttctctg	atttcccgct	ttccagcgtt	13980
cggcacgcag	acgaacgggt	tcattctgca	tgggttgtgt	taccagaccg	gagatattga	14040
catcatatat	gccttgagca	actgatagct	gtcgtgttca	actgtcactg	taatacgtctg	14100
cttcatagca	cacctctttt	tgacataact	cgggtagtgc	cgatcaactg	ctcattttctg	14160
ccaaaagttg	gcccagggct	tccccgtatc	aacagggaca	ccaggattta	tttattctgc	14220
gaagtgatct	tccgtcacag	gtattttatc	ggcgcaaaagt	gggtcgggtg	atgctgcaca	14280
cttagtctgac	tacaggctcac	taataaccatc	taagttagttg	attcatagtg	actggatatg	14340
ttgtgtttta	cagtattatg	tagtctgttt	tttatgcaaa	atctaattta	atatattgat	14400
atttatataca	ttttacgttt	ctcgttcagc	ttttctgtac	aaagtgggtct	cgaaggaattc	14460
ggtaaccaact	gtaaggaaat	aattattttc	ttttttcctt	ttagtataaa	atagtttaagt	14520
gatgtttaatt	agtatgatta	taataatata	gttgtttataa	ttgtgaaaaa	ataatttata	14580
aatatattgt	ttacataaac	aacatagtaa	tgtaaaaaaa	tatgacaagt	gatgtgtaag	14640
acgaagaaga	taaaagttga	gagtaagtat	attattttta	atgaatttga	tcgaaactgt	14700
aaqatgatat	actagcatta	atatttgttt	taatcataat	agtaatttcta	gctggtttga	14760
tgaattaaat	atcaatgata	aaataactata	gtaaaaaata	gaataaataa	attaaaaata	14820
tattttttta	tgattautag	tttatttat	aattaaatat	ctataaccatt	actaaataat	14880
ttagttttaa	agtttaaaaa	tattttttta	gaaatttccaa	tctgtcttga	atttatcaat	14940
aaacaaaaata	ttaaatcaaa	agctaaagta	acaaataata	tcaaaactaat	agaaacagta	15000
atotaatgta	acaaaaacata	atotaatgct	aataataacaa	agcgcaagat	ctatcatttt	15060
atatagtatt	attttcaatc	aacattctta	tttaatttcta	aataataact	gtagttttat	15120
taactttctaa	atggattgac	tatttaattaa	atgaattagt	cgaacatgaa	taaaacaaggt	15180
aaatgatag	atcatgtcat	tgtgttatca	ttgatcttac	atttggattg	attacagttta	15240
cttaccttaa	gcttgggtcc	tctagaccac	tttgtacaag	aaagctgaac	gagaaaagta	15300
aaatgatata	aatatcaata	tattaaatta	gatttttgcac	aaaaaacaga	ctacataata	15360
ctgtaaaaaca	caacatatcc	agtccatctg	aatcaactac	ttagatggta	ttagtgaact	15420
ctagtccgact	aagttggcag	cattcaccga	cgcactttgc	gcbgaataaa	tacctgtgac	15480
ggaaagatcac	ttcgcagaat	aaataaaatcc	tgggtgtccct	gttgataccg	ggaagccctg	15540
ggccaaacttt	tggcgaaaaat	gagacgttga	toggattttca	caacttttat	actttctctc	15600
tacaagtgct	toggcttcat	ctggattttc	agcctctata	cttaactaaac	gtgataaagt	15660
ttctgttaatt	tctaactgtat	cgacctgcag	actggctgtg	tataaaggag	cctgacattt	15720
atattcccca	gaacatcagg	ttaatggcgt	ttttgatgtc	attttccggg	tggctgagat	15780
cagccacttc	ttccccgata	acggagacgc	gcacaactggc	catatcgggtg	gtcatcatgc	15840
gccagctttc	atccccgata	tgcacccacc	ggtaaaagttc	acgggagact	ttatctgaca	15900
gcagacgtgc	actggccagg	gggatccacca	tccgtgcacc	gggogtgtca	ataatatcac	15960

tctgtacatc	cacaaaacaga	cgataaaggc	tctctctctt	atagggtgtaa	acctttaaact	16020
glatttcacc	agtccctgtt	ctgttcagca	aaagaggggt	tcattttcaat	aaacgggggt	16080
acctcagcca	tcccttcctg	atttttcggt	ttccaggggt	ggcagcgag	agcaggggt	16140
ttattctgca	tgggttgtgt	taaccagacgg	gagatattga	catacatatat	gccttgagca	16200
attgatagct	gtggtctgta	acgtcactg	taataagctg	cttcataagca	cacctctttt	16260
ttacataact	ctgttcttga	tgcagatgat	tttcaggact	atgacaactag	cgtatatgaa	16320
ttgggtagatg	tttttatctt	gtcacacaaa	aaagagggtc	gtaactcttt	ttcttatctt	16380
tttttatgat	tttaatacgg	attgaggaca	atagcgagta	ggttggatac	gaagattccg	16440
tttgagaaga	acattttgaa	ggctgtcggt	cgactaagtt	ggagagatca	cccgagaac	16500
atttggaagg	ctgttcgggt	actacagggt	actaatacca	tctaaagtagt	tgattccatag	16560
tgactggata	tgttctgttt	taagtatatta	tgtagtcgtt	tttttatgca	aaatctaat	16620
taatatattg	atattttatat	catttttaagt	ttctcgttca	gcttttttgt	acaaaacttgt	16680
ctagagtcct	gcttttaatga	gatatgcgag	acgcctatga	tgcgatgata	tttgccttca	16740
attctgttgt	gcacgtttgt	aaaaaacctga	gcattgtgtag	ctcagatcct	taacgcgggt	16800
ttcgggtcat	tctaatgaat	atatcacccg	ttactatcgt	atttttatga	ataatattct	16860
cggttcaatt	tactgattgt	accctactac	ttatatgtac	aatattaaaa	tgaaaaacaat	16920
atatttgtgt	gaatagggtt	atagcgacat	ctatgataga	gcgcacacaat	aacaaaaaat	16980
tggtttctat	tattacaaat	ccaattttat	aaaaagcggt	agaacgggtc	aaacttaaaa	17040
gaactgattac	ataaatctta	ttcaaatctt	aaaaggccct	aggggtcagt	atctacgaca	17100
cacccagcgg	cgaactaata	acgttcaact	aagggaactc	cgggttcctg	ccggcccgca	17160
tggttgagat	tccttgaaat	tgagtattgt	cgttcgggtc	taacgaaagt	taacggccac	17220
attcaacccg	gtccagcag	ggggccgggt	aaccgacttg	ctgcctcgag	aattatgcag	17280
catttttttg	gtgtatgtgg	gccccaaatg	aagtgcaggt	caaaccttga	cagtgaacgac	17340
aaatcgttgg	gggggtccag	ggcgaatttt	gcgacaacat	gtcaggggtc	agcaggacct	17400
gcaggccatgc	aagctagctt	actagtgatg	catattctat	agtgtcacct	aaatctgc	17460

110 26

111 17681

112 DNA

113 Artificial sequence

220

225 acceptor vector pHEILSGATE12

400 26

gggcycaata	gtgatatccc	ggggccatgg	cgggccgggag	catgcgacgt	cgggcccaat	40
ccggccctata	gtgagtcgta	ttacaattca	ctggcccgctg	ttttacaaag	tctgcatgg	100
gaaaaccctg	gggttaaccca	acttaaatgc	cttgccagcac	atcccccttt	cgccagctgg	160
tgtaatatgc	aagagggccg	caccgatcgc	ccttcaccaac	agttggcgag	cctgaaatgc	240
gaatggaaat	tgtaaaagtt	aatgggtttc	tggagtttta	tgagctaaag	acatacgtca	300
gaaaaccatta	ttgcgcgttc	aaaagtcgca	taaggtcaat	atcagctagc	aaatartttc	360
tgtcaaaaaa	gctccactga	cgttccataa	attccccctg	gtattcaatt	agagtctcat	420
atttactctc	aatccaaaata	attctgcaatg	gcaattacct	tatccgcaac	ttctttacct	480
atttccggcc	ggatccgggc	aggttctctg	gcccgttggg	tggagaggct	attccgctat	540
paatggggac	aacagacaat	cggctgtctc	gatgcggccg	tgttccggct	gtcagggcag	600
ggggcccccgg	ttctttttgt	caagaccgac	ctgtccgggt	ccttgaatga	actgaggagc	660
gagccagcgc	ggctatcgtg	gctggccacg	acggggcgtc	cttggccagc	tgtgtctgac	720
cttctcactg	aagccgggaag	ggactggctg	ctattggggc	aagtgcgggg	gcaggatctc	780
ctgtcatctc	accttgcctc	tgcgcagaaa	gtatccatca	tggctgatgc	aatggggcgg	840
ctgataacgc	ttgatccggc	taacctgccc	ttcgaccacc	aagcgaaaaca	tcccatcgag	900
cgagcaactga	ctcggatgga	agccgggtct	gtcgatcagg	atgatctgga	cgaagagcat	960
gaagggcctcg	cgcagccgga	actgttcgcc	aggctcaagg	cggccatgcc	cgaacggcag	1020
gatctcctcg	tgacccatgg	cgatgcctgc	ttgcgcgaata	tcattggtgga	aaatggccgc	1080
ttttctggat	tcactgactg	tggccggctg	ggtgtgtggg	accgctatca	ggacatagcg	1140
ttggctaccc	gtgatattgc	tgaagagctt	ggcggcgcaat	ggcctgaacg	cttctcctgt	1200
cttttaaggta	tgcgcgctcc	cgatttcgag	cgcctcgcct	tctatcgcct	tcttgaacgag	1260
ttctcttgag	cgggaactct	gggttcgaaa	tgaccgacca	agcgacgccc	aaactgccat	1320
caagagattt	cgatttcacc	gcgcctctct	atgaaaaggt	gggcttcgga	atcgtttttc	1380
gggacgcggg	ctggatgata	ctccagcgcg	gggatctcat	gctggagttc	ttcggccacc	1440
cggatccaac	acttaacgtt	gcacagctca	agagcaaaata	gaaccaagaac	gcgggaaggt	1500

tgagagagag	tgaggattgg	gtotcaatto	totottgag	gaatgcaatg	atgaatatga	1560
taattgaatt	gaaattttga	gggaataatg	totaggaagg	toaatocata	acgtgcatca	1560
tgatgagggg	gaaacatagg	aaatagotta	tttttttgaa	gaattatggt	cggtggagga	1560
tgatgagggg	attggagotta	ttggcaaat	ggaaatcaac	ctcagagatg	catcagatcaa	1560
tattattcat	gggggaaag	gaaagatcaa	tcaactggg	aaatcatcca	gggtgattgg	1560
taacttcagt	tccagagaggt	cgattoggtt	gggtggtacc	caatgtttca	ataaggagga	1560
gatggggagg	taaaagaaagg	gtggttgaa	gcagatcggt	caaaacatttg	gcaataaagt	1560
ttortaaagt	tgaattcctgt	tgccgggttt	gggatgatta	toatataatt	totgttgaat	1560
taaggttaagg	atgtaataaat	taaacatgtaa	tgcattgaagt	tatttatgag	atgggttttt	1560
atgattagag	tcccgcaatt	atacatttaa	tacggagatag	aaaaacaaaa	atagcgcgca	1560
aaataggata	aattatcgog	cggggtgtca	totattgtta	tagatogaat	taattccagg	1560
cggtgaaggg	caatcagotg	ttggccgtct	cactgggtgaa	aagaaaaaac	acccacagta	1560
attaaaaaag	tccgcaatgt	gttattaaagt	tggtotaagg	tcaatttggt	tacacacaaa	1560
tatatccctg	caacagccag	ccaacagctc	cccgacccgg	agctccggac	aaaatcacca	1560
ctcgatacag	gcagcccatc	agtcggggac	gggtccaggg	ggagagccgt	tgttaagggg	1560
cagaatttgg	tcatgttacc	gatgctattc	ggaagaaagg	caactaagct	gcgggtttg	1560
aaacacggat	gatctcgogg	agggtagcat	gttgatttga	acpatgacag	agcgttgctg	1560
cctgtgatca	aatatcatct	ccttcggaga	gacccgaatt	atcagccttc	ttattcattt	1560
ctogcttaac	cgtgacaggg	tgtoatcttt	gagaactatg	ccgacataat	aggaaatcgc	1560
tggtataaag	cgtcagggaa	gttcaagggg	gctatttctt	tanaagtgaa	cgttgcagat	1560
gtcgagggat	cttttcgggt	gcataaccc	gcttcgggg	catttatagc	atttttttgg	1560
tatatccatc	cttttttgg	cgatatacag	gattttggca	aaggggttct	gtagacttct	1560
cttggtgtat	ccaacggggt	cagcggggca	ggatagttga	agtagggcca	cccgagaggg	1560
gggtgtctct	cttactgtc	ccttatctgc	acctgpcgg	gctcaacggg	aactctgctc	1560
tgogagggctg	gcgggtctac	gcggggttaa	cagatgaggg	caaggggatg	gctgatgaaa	1560
ccaagccaac	caggggtgat	gctgcaaac	tactgattta	gtgtatgatg	gtgttttga	1560
gggtgctccag	tggtttctgt	ttctatcagc	tgctcctct	gttcagctac	tgcaggggtg	1560
gtggttaag	gcaaaaagta	cgctggacat	caggggtatc	totgtctca	ctgggtttaa	1560
acatgggaag	tgcaggttac	ttaracgggt	totcaacccg	gtacgcacca	gaaaaatcatt	1560
gatatggca	tgaatgggt	tggtatgggg	gcaacagbcc	gcatttatgg	cgttgggctc	1560
aaacagatct	tacgtcaatt	aaaaaactca	ggcggcagtc	ggtaaccccg	gcatacagc	1560
cgggpcagtga	cgttatcgtc	tgccgggaaa	tggaagaaac	gtgggggtat	gtcgggggta	1560
aatcgccga	gcgctgctg	ttttacgggt	atgacagctt	cgggaagacg	gttgttgccg	1560
acgtattcgg	tgaacgcact	atgucgagcg	tggggggtct	tatgagcctg	ctgtcacctt	1560
ttgacgtgt	gatattgatg	acggatggt	ggcgggtgta	tgaatccggc	ctgaaggggaa	1560
agctgcacgt	aatcaggaag	cgaratacgc	agcgaattga	cgggcataac	ctgaatctga	1560
ggcagcact	ggcagggctg	ggacgggaat	cgtgtggtt	ctcaaaaatc	gtggagctgc	1560
atgacaaaat	catcgggcat	tatctgaaca	taaaaacata	tcaataaggt	ggagtcatca	1560
cccaacccagg	aagggcagcc	cacctatcaa	ggtgtactgc	cttcagagag	aaaggaagag	1560
gatttgagga	aaaggcgggg	cgccccggcat	gagcctgtct	gcctacctga	tgccgtcgg	1560
ccaggggtac	aaaatcacgg	gcgtcgttga	ctatgagcac	gtccggcaga	tgcggcgcat	1560
caatggcgac	ctggggcgcc	tgggggcgct	gctgaaaact	tggtcaccg	acgaaccccg	1560
caaggcgagg	ttcgtgtatg	ccaagatct	cgccatgctg	gcgaagatgc	aaggaagaga	1560
ggacagagctt	gggaaggtoa	tgatgggggt	gxtccggccg	agggcagagc	catgactttt	1560
ttagccgtta	aaaaggccgg	gggtgtgggg	tgattgcbaa	gcaggtcccc	atgpggtcca	1560
toagaaadag	cgarittggg	gaggtgttat	tggtgcaggg	caagattcgg	aataccaggt	1560
acgagaagga	cgggcaagag	gtctacggga	cggatctcat	tyccgataag	ggggatttat	1560
tggaacacaa	gggacagggc	gggtcaaatc	aggaataagg	gcacattgct	cgggtgttag	1560
tcggggcaat	ccggcaaggga	gggtgaatga	atcggaaggt	tgacccggag	gcatacaggg	1560
aagaaatgat	cgaagcgggg	ttttccggcg	agjatgcoga	aaacatcgga	agcggcaggg	1560
toatgggtgc	gcggcgcgaa	accttcaggt	cgttcggctc	gatgggtccg	caaggtacgg	1560
ccaagatcga	gcgggacagc	gttcaactgg	ctccctctgc	cctgcccggg	ccatcgcccg	1560
cgggtggaggg	ttcggctcgt	ctcgaaagg	agggggcagg	ttgggggaag	togatgacaa	1560
tcgacaacgg	aggaactatg	acgacccaga	agcgaaaaac	cgcggggcgg	gacctggcaa	1560
aaacaggtcag	cgaaggccaag	cagggccgggt	tgctgaaaca	cacgaagcag	cagatcaagg	1560
aaatgcagct	ttccttggtt	gatatttggc	cgtggccggga	cacgatgcga	gcgatgcbaa	1560
acgacacggc	cggctctggc	ctgttcacca	cgcgcacaaa	gaaaaatccg	cgcgagggcg	1560
tgcaaaaacaa	ggtaattttc	caagtcacaa	aggaagtgaa	gatacactac	acgggctgtg	1560
agctgggggg	cgaagatgac	gaaactgggt	ggcagcaggt	gttggagtag	gcgaagcgca	1560
cccttatcgg	cgaagcgatc	accttcaggt	totaagagct	ttggcaggac	ctggggtggg	1560
cgatcaatgg	cgggtattac	acgaaggcgg	aggaatgctt	gtcgggacta	caggcgacgg	1560

agatggggtt	baagtccgac	agagttgggg	acgtgggaatc	gggttcggtg	ctgcaacgggt	5220
tcgggttcgt	agacgttggc	aagaaaaagt	acgtttggaa	gggttcggtg	gaagaggaaa	5280
tcgttcgtgt	gtttgttggg	gaacacataca	cgaaatttcac	atgggagaaag	taacggcaagc	5340
tcgttcgagc	ggcccgaggg	atgttcgaat	atttcagctc	ggaacgggag	cggtaacggc	5400
tcaggttggc	aaacattccgg	ctcatgtggg	gatcggatcc	caacccgggtg	aagaagtggc	5460
tcaggttcgt	cgccgaagcc	tggaagaggt	tggaaggagc	cggttcgggtg	gaacacggct	5520
gggtcaatga	tgaccttggg	caatgcacac	gctagggtcc	tggtgggtca	gttcgggtg	5580
gggttcagc	agccaggggt	ttactggcat	ctcagggaaca	agcggtcaat	gctcgaacga	5640
ctgttcctgc	tcagttatgc	tcgggaagca	cggttcggtc	taacgaactgc	cgataaacag	5700
aggattcaaaa	ttgacaattg	tgattaaagg	tcagatttga	cggttcggag	cgcccgacgt	5760
gcaggatttc	cgcgagatcc	gattgttcgg	ccgtgaagaaa	gctccagaga	tggttcgggtc	5820
cgtttaacag	caacaggaga	aaaagcccat	ggaggcggtc	gctgaacggc	tgcajatgc	5880
cggttcgatt	ggcgccataca	tcgaacggga	gacatttggg	ctgttcgggtc	tcacacaggga	5940
ggagggccccc	aaggacgctc	acaaggcgca	tcgttcgggtc	ggttttcgtg	agcccgaaac	6000
ggagggccga	gggttcggcg	gtatgctgct	ggggcggttg	cggttcgggtc	tattggtcgt	6060
gatgatctgc	cgacagattc	caacgggaat	ctgggtggatg	cgcatcttca	tccttcggcg	6120
acttaataatt	tcgttattct	ggagcttgtt	gtttatttgc	gtctaacggc	tgccggggcg	6180
gggttcggcg	acgttagggc	ctgttcggcg	gctgatgggtc	gtgttcctct	ctgcgggtct	6240
gctaggttagc	ccgatacgtc	caaacgcgag	ccgttcgggtc	atgttcggga	ctgcgggtct	6300
ggcgctgttg	gtgttcgacac	cggttcggga	gctagatcct	gtccgggtcg	caacgggtct	6360
ggcggtggcg	gttttcgacg	ccgttcggga	cggttcggga	ggacttcctg	tcgttcgagt	6420
gctctctgct	acgttcacgc	caatcccgat	gcttaacggga	accaatgttc	tcgttcgagt	6480
agctttagtg	tttjatccgc	cggttttaac	ctacttcctt	tggttcgggg	ggatctcgcg	6540
gtgggttcgac	ctgatccggg	ccgttcggga	cttttcgacg	cggttcgggg	ctaaagagct	6600
actcgaacct	acagtttgtt	gcttatctgaa	ataccgcaca	gatgcgttaag	gagaaataac	6660
atttcggcg	atcttcacat	tccttcgctc	actgactcgc	tgcttcgggt	cggttcgggtg	6720
cgcatcagac	gcttttcgct	ctcaaacggg	gtaatacggc	tatccacaga	atcaggggat	6780
cggttcggcg	tatcagctca	agcaaacggc	cagcaaacgg	ccaggaaacg	taaaagggcc	6840
aaacggagaa	agaaacatgt	taggttcgac	cccttcgacg	agcatcaca	aaatcagcgc	6900
gggttcggcg	cggtttttca	ccgttcggga	ctataaacgat	acagggcggt	tccttcggga	7020
tcaggttcgac	tggttcgctc	gttttcgac	ctgcgggtta	cggttcgctc	gttcgggttt	7080
ctcccttcgg	gaagcggtgc	gttttcgac	tgcttcgctc	cggttcgacg	cggttcgctc	7140
taggttcgct	gctccaaagt	gggttcgctc	caacgaaccc	gacacgactt	atcggttcg	7200
gctttatcgc	gtaactatgc	tcgttcgac	aaacgggtta	taggttcgctc	taacaggttc	7260
ccagcagcga	ctggttaacg	gatttcgac	gagaggtatg	taggttcgctc	ctgcgttcg	7320
ttggaagcgt	gggttaacta	cggttcgact	agaaggacag	tatttcggtt	ctgcgttcg	7380
ctggaagcag	ttaccttcgg	aaaaagagtt	ggtagctctt	gatccggcaa	acaaaacacc	7440
gctggttagc	gtggtttttt	tggttcgacg	cagcagatta	cggttcgaaa	aaaaggtat	7500
caagaagatc	ctttgatctt	ttctacggcg	tcgtacgctc	agtggaacga	aaacttcagc	7560
taaggggattt	tggttcgat	atttatcaaaa	aggatcttca	ccagatctct	tttaaattaa	7620
aaatgaagtt	tttaaatcaat	ctaaagcata	tatgaagtaa	cttggttcg	cagttaccaa	7680
tggttaactca	gttaggcac	tatcttcgac	atctgcctat	ttcggttcac	catagttcgc	7740
tgactcccg	tcgttcgat	aaacttcgata	cggttcggtc	tacatctcgg	cccttcggt	7800
gcaatgatcc	cggttcgac	acgttcacgc	gcttcagatt	tatcagcaat	aaacagcga	7860
ggcggaaggg	ccgajcgcag	aatgttcgct	gcaacttcac	ccgttcgctc	ccagttcatt	7920
aaacaggttg	cgcaaacgga	ttcgcaaac	tgcttcgctc	ttgttcgcaa	aagcgcggcc	7980
aggttttcgga	tcgttcgac	caaggttcag	ggttcacatg	aagatttcg	tgatccctga	8040
gcajgttcg	gaacacattg	atgttcgaga	ccatttcatt	gttcgttcg	tgatccctga	8100
gcaactatcc	gaacacattg	ttgaactatc	taccagaagt	gtgagcgcct	acgttcgaga	8160
ttacatctgc	gatgatgact	ctgttcgacg	ctgttcgacg	tatggttcac	ctatcgaaca	8220
agaggttcg	gggaagattg	aaacttcac	aaacttcgac	gatctagcct	tcgaatttcg	8280
caatgttcg	tcgacacgc	acgttcgac	aggagtcgac	caagtttcac	aaacgaacaa	8340
gaaaaagtg	gcaactaagc	gaacacattg	tggttcac	ctcggttcg	ttgacttcg	8400
tgtaacttcg	tgcaatttcg	acgttcgac	cgaaacagcg	atgttcggt	actggttcg	8460
caogtatata	actagacctc	aaacttcgac	tcagacgcac	acgttcgac	ggcggttcg	8520
gggagacag	gatgacgcct	aaacttcgac	gggttcgac	gaagtatcga	ctcaactatc	8580
aatttcaggag	ttaaacatca	tgaggttcg	cggttcgac	ttgttcgac	tacatttcg	8640
agaggttagt	gggttcacgc	gcttcgaagc	acacagtgat	attgatttcg	tggttcaggt	8700
cggttcgac	gtggttcg	caacggcgcg	aggttttcg	aaacaccttc	tggaacttc	8760
gacgttaagg	cttgatgaaa					

aggccatgca	tggagctctaa	gattcacaato	gaggatcttaa	cagaaacttgc	cgtagaagaat	12540
ggcgaaacag	tcatacagag	tctttttaa	ctcaatgaca	agaagaaaaat	cttcgtcaaac	12600
atgggtgagc	aggaacattct	ggtctacttcc	aaaaatgtca	aagatacagct	ctcagaagagc	12660
caaaagggtct	tggagactttt	tcacacaaaag	ataatttttgc	gaaaccttctt	cggtattctct	12720
tgcccagctc	tctgtcaactt	catacagaaag	acagtagaaaa	aggaaaggttg	ctctacacaaa	12780
tgccatcatt	ggatataaag	aaaggctatct	attcaagatct	tctctggcaga	cagtggtctcc	12840
aaagatggac	ccccacccac	gaggagcact	gtggaaaaaag	aagacgtttcc	aaacacgtctt	12900
tcaaaagcaag	tggattgattg	tgacatcttcc	actgaagctaa	gggatgagcgc	acaatccccc	12960
tatctcttgc	aagaccccttc	ctctatataaa	ggaggttctat	ttcattttgga	gaggacacgc	13020
togagacaaag	tttgtacaaa	aaagctgaac	gagaaaaagta	aaatgatata	aatatcaata	13080
tattaaatta	gatttttgtat	aaaaaacaga	ctacataata	ctgtaaaaaca	caacatatctc	13140
agtcactatg	aatacaactac	ctagatggta	ttagtgaact	gtagtgcagc	gacagccttcc	13200
caaatgtctct	tgggtgagtg	ctgccaactt	agtcgaccca	cagccttcca	aatgttcttcc	13260
tcaaaacggaa	tggctgtatc	cagcctacttc	gotattgtcc	tcaatgcctg	attaaatcat	13320
aaaaagaaaat	aagaaaaaga	ggtgogagcc	tcttttttgt	gtgacaaaaat	aaaaacatct	13380
acctatctcat	atacgcctagt	gtcatagtcc	tgaaaaatcat	ctgcacaaag	aaacaatttca	13440
caactcttat	actttttctct	tacaagctgt	togggttctat	ctggatttttc	agcctctata	13500
cttactaaaa	gtgataaagt	ttctgttaatt	tctaactgtat	cgacctgcag	actggctgtg	13560
tataaggag	cctgacattt	atattccccc	gaacatcagg	ttaatggcgt	ttttgatgtc	13620
attttctggg	tggtcgagat	cagccaacttc	ttcccagata	acggagaccc	gcacactggc	13680
catatcgggt	gtcatcatgc	gcccagcttcc	atcccagata	tgcaccaccg	ggtaaaagtt	13740
acgggagact	ttatctgaca	gcagacgtgc	acnggcagag	gggatcacca	tcogtgcgcc	13800
ggcgtgtca	ataatatcac	tctgtacatc	caaaaacaga	cgataacggc	tctctctttt	13860
ataggtgtaa	acottaaaact	gcatttcacc	agtcctgtgt	ctcgtcagca	aaagagccgt	13920
tcatttcaat	aaaacgggct	acctcagcca	tcctctctgt	attttccgt	ttccagcgtt	13980
cgccacgcag	acgacgggct	tcattctgca	tggttggtgt	taaccagacc	gagatattga	14040
catcatatat	gcctcgagca	actgatagct	gtcgtgtca	actgtcactg	taatacgcgt	14100
cttcatagca	cacctctttt	tgacataact	cgggtagtgc	cgatcaacgt	ctcatttttc	14160
ccaaaaagttg	gcccagggtt	tcocgggtatc	aacaggga	ccaggattta	tttattctgc	14220
gaagtgatct	tcogtcacag	gtattttatc	ggcgcaaaat	gcgtcgggtg	atgctgcaca	14280
cttagtcgac	tacaggtcac	taataccatc	taagtatttg	attcatagt	actggatatt	14340
ttgtgtttta	cagtattatg	tagtctgttt	tttatgcaca	atctaattta	atatattgat	14400
atttatatca	ttttacgttt	ctcgttcagc	ttctctgtac	aaagtggctt	cgaggaattc	14460
ggtaccccag	cttggttaagg	aaataattat	ttcttttttt	ccttttagta	taaaatagtt	14520
aagtgatggt	aattagtatg	attataataa	tatagttggt	ataattgtga	aaaaataatt	14580
tataaataata	ttgtttccat	aaacaacata	gtaatgtaaa	aaaatatgac	aagtgtatgt	14640
taagacgaag	aagataaaaag	ttgagagtta	gtatattatt	tttaatgaat	ttgatcgaac	14700
atgtaagatg	atatactagc	attaatattt	gttttaataa	taatagtaat	tctagctggt	14760
ttgatgaatt	aaatatcaat	gataaaaatac	tatagtaaaa	ataagaataa	ataaattaaa	14820
ataatatattt	tttatgatta	atagtttatt	atataattaa	atatctatcc	cattactaaa	14880
tatttttagtt	taaaagttta	taaatatatt	gttagaaaatt	ccaatctgct	tgtaatttat	14940
caataaaca	aatattaaat	aaacagctaa	agtaacaaaat	aatatcaaac	taatagaaac	15000
agtaactcaa	tgtaacaaaa	cataacttaa	tgtataatata	acaaagcaga	agatctatca	15060
ttttatatag	tattattttc	aatcaacatt	cttattaatt	tctaataaat	actgttagtt	15120
ttattaaactt	ctaaatggat	tgactattaa	ttaaatgaat	tagtcgaaca	tgaataaaca	15180
aggtaacatg	atagatcatg	tcatttghgt	atcattgtac	ttacatttgg	attgattaca	15240
gttgggaagc	tgggttcgaa	atcgataaag	ttggtgtgca	gttatcatca	tcattcataga	15300
cacacgaaat	aaagtaatca	gattatcagt	taaggtatg	taatatattgc	gpcataacca	15360
atcaattaaa	aaatagatca	gtttaaagaa	ajataaaaagc	tcaaaaaaat	aaaaagagaa	15420
aagggtctca	accaagaaaa	tgaaggagaa	aaactagaaa	tttacctgca	caaggttggc	15480
tcctctagac	cactttgtac	aagaaaactg	aacgajaaac	gtaaaatgat	ataaatatca	15540
atatattaaa	ttagattttg	caaaaaaac	ajactacata	atactgtaaa	acacaacata	15600
tcacgtcact	atgaatcaac	tacttagatg	gnattagtga	cctgtagtgc	actaagttgg	15660
cagcatcacc	cgaacgaactt	tggccgaat	aaatacctgt	gaaggaaagt	caacttcgag	15720
aataaataaaa	tcctgggtgtc	cctgttgata	cggggaagcc	ctgggccaac	ttttggcgaa	15780
aatgagacgt	tgatcggatt	tcacaaactct	tatacttttc	tcttacaagt	cgttcggctt	15840
catctggatt	ttcagctctct	atacttaact	aacgtgataa	agtttctgta	attttctactg	15900
tatcgacctg	cagactggct	gtgtataagg	gagcctgaca	tttatattcc	ccagaacatc	15960
aggttaattgg	cgtttttgat	gtcatttttc	cgggtggctga	gatcagccac	ttcttccccc	16020
ataacggaga	cgggcacact	ggccatctcg	gtggctcatca	tggccagcgt	ttcatccccc	16080
atatgcacca	cgggttaag	ttcacggggg	actttatctg	acagcagacg	tgcactggcc	16140

aggggagatca	ccatcccggtg	ccgggggagtg	ccaaataaatat	caactctgtac	atccacaaaaa	16200
agagagatbaa	ggctctctctct	ctccataggttg	taaaaccttba	actgcatcttc	accagctccct	16260
gtttctcgtaa	ccaaaaagagc	ggttccatcttc	aatataaacagg	ggagacctcag	ccatccctctc	16320
ctgattcttcc	gctttccaggc	gttccggcagc	ccagagagccgg	gcttccatctct	gcatgggttctg	16380
gcttaccaga	ccggagagatat	tgaacatccata	tatgcctcttga	gcacacctgata	gttggtcgcttg	16440
ccaaactgtca	ctgttaataag	ctgcttccata	gcacacccctct	ctttgacata	ctttctgtttat	16500
tgatgcagat	gattcttccagg	acatctgacac	tagcgtatat	gaataggttag	atgttttttat	16560
tttggtccaac	aaaaaaagagg	ctcgccacctc	cttttctcttat	ttcttttttat	gattttaataac	16620
ggcattcgagg	acaaatagcga	gttaggcttga	tagaacggatt	ccgtttcgaga	agaaacatttg	16680
gaaggctcttc	gctcgacctaa	gttggcagcca	ccacccggaag	aacatttggga	aggctgtctgg	16740
ccgaactacag	gtcaactaata	ccatcttaagt	agttgattcca	tagtgactgg	atatgtttgtg	16800
ttttacagta	ttatgtagtc	tgtttttttat	gcacaaatcta	atttaaatata	ttgatatttta	16860
tatcatttcca	cgtttctcgt	ccagctttttt	tgtacaaaact	tgtctagagt	ccgtgctttta	16920
tgagatatgc	gagacgccta	tgatcgcatg	atattctgctt	ccaattctgt	tgtgcacggt	16980
gtaaaaaaacc	tgagcatgtg	tagctccagat	ccttacccgc	ggtttcgggt	cattctaatg	17040
aatatatcac	ccgttaactat	cgatattttta	tgaataaatat	tctccgttca	atttactgat	17100
tgtaccctac	tacttatatg	tacaatatta	aaatgaaaaac	aatatattgt	gotgaatagg	17160
ttttatagoga	catctatgat	agagcgcac	aataacaaaac	aattgcgttt	tattattaca	17220
aatccaatttt	taaaaaaaagc	ggcagaaaccg	gtcaaaccta	aaagaactgat	tacataaato	17280
ttattccaaat	ttcaaaaaggc	cccaggggt	agtatctacg	acacacccgag	cggcgaacta	17340
ataacgttca	ctgaaggggaa	ctccgggttcc	ccgcgggggc	gcattgggtga	gattccttga	17400
agttgagtat	tgcccggtccg	ctctacccgaa	agttacgggc	accattccaac	ccggctccagc	17460
acggcgggccg	ggtaaccggac	ttgctgcccc	gagaattatg	cagcattttt	ttgggtgtatg	17520
tggggccccaa	atgaagtga	ggtcacaaact	tgacagtga	gacaaatcgt	tgggcggggtc	17580
cagggcggaat	tttgcgacaa	catgtcgagg	ctcagcagga	cctgcaggca	tgcaagctag	17640
cttactagtg	atgcatatcc	tatagtgtca	cctaaatctg	c		17681